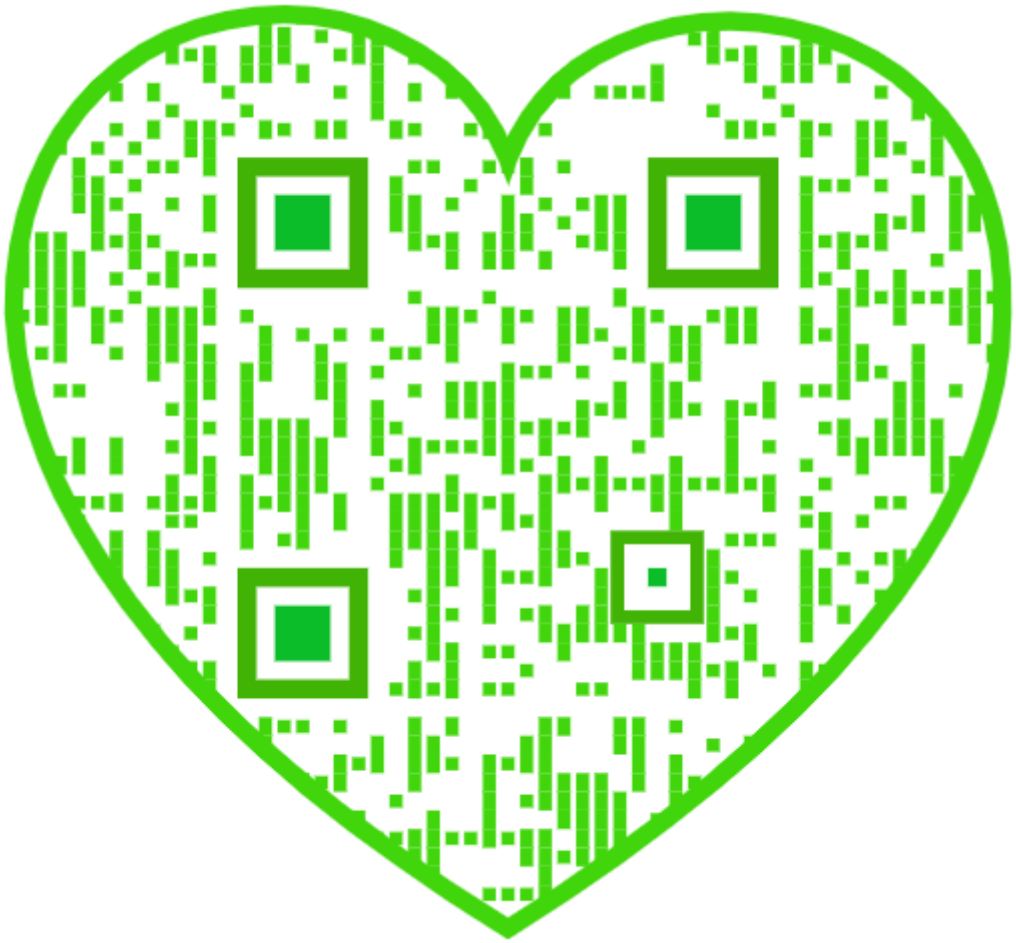

THE

BOY'S OWN TOY-MAKER:

A

Practical Illustrated Guide

TO THE

USEFUL EMPLOYMENT OF LEISURE HOURS.

BY

E. LANDELLS,

AUTHOR OF "HOME PASTIME; OR, THE CHILD'S OWN TOY-BOOK."

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INTRODUCTION.

This is a boy's book in which the author has tried with his pen and pencil, to teach some useful things for the pleasant time of play hours. It is a plain book, which he hopes will be easily understood by any boy old enough to be trusted with such common tools as a penknife or a pair of scissors, and still be equally suited for the pastime of those who, of riper age, aspire to manlier amusement.

It is commonly supposed that the trade of the toy-maker is a frivolous pursuit that has no right to be classed in the useful labours of life; and grave men have shaken their heads at the poor toy-maker, not because he often and justly may be blamed for a great deal of childish work, but by reason that his labours can only end in the amusement of children. The author thinks differently, and would even venture to hint, that if the maker of toys would follow the good example of those for whom he makes them, and go to school to learn, his trade would stand higher amongst the useful and dignified callings, and he

himself might perhaps in time be joined as a helper to the schoolmaster. He will become less frivolous the more that grave men look kindly on the labours that endeavour to unite instruction with the amusements of the juvenile circle. Ours is an attempt in this direction, and not an aimless one at book-making.

Many of our young friends have no doubt heard their parents join in the lament that has been made by some clever men on the general want of knowledge of "common things." Grown men, who could talk with Virgil or Homer in their own tongues, are ignorant of many things of every-day life, which very little children are now taught in play and learn with scarcely an effort. It must not be imagined that we think lightly of the graver labours of the school-hours when boys come to learn Greek and Latin, and the other branches of knowledge so necessary to fit them to take a place in society as educated men; we would only illustrate the aim of this little book as a teacher for the play-hours by putting a question: Who would be the more useful person of two cast on Robinson Crusoe's desert island—the man who could only speak Greek and Latin, or the boy who, in hour of need, would erect a little hut or even construct a boat from the lessons learnt in play-hours?

The boyish days of many of the great men who have enlightened the world by their discoveries and inventions have been remarkable for the practical bias their minds have taken. James Watt, when a boy, first discerned the power of steam by watching the spout of a common tea-kettle. The great Sir Isaac Newton was the first to introduce the paper kite, when a little school-boy at Grantham. George Stephenson, who in our own day has done such great things for human progress, was in boyhood always making lilliputian mills and clay engines in a small stream that ran by his father's cottage. Whoever would be a great inventor to the benefit of humanity must begin to learn common things in very early life; for so vast is the accumulation of knowledge heaped up by ages and the inventive industry of mankind, that if the task of learning be deferred until the business of life, with its thousand cares and distractions, begins, knowledge cannot ripen enough, even when a long one ends, for the harvest of that one ambition which youth and men may own without reproach—to be great in usefulness in their generation, to their country, and to their kind.

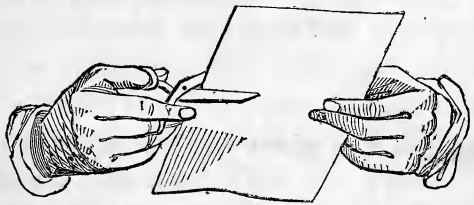
All children in a degree love to construct, and this surely points to a most practical means of conveying

instruction when you provide amusement. The boy engaged in making a toy-house becomes half an architect in the knowledge acquired of the names and uses of forms and materials which, without a model, he could hardly comprehend. He who forms a tiny boat or cutter, and rigs it himself, acquires a familiarity with every rope and spar that belongs to the vessel; he acquires a knowledge which, without going so far as the island desert, may any day of life be of valuable service to him who inhabits an island home. Knowledge is power; the more practical it is the more powerful will it be for our good and for that of our fellow-beings, and it is hoped that our young readers will have reason to remember with a kindly regard among the thousand common circumstances of life, the instruction imparted in these pages.

THE

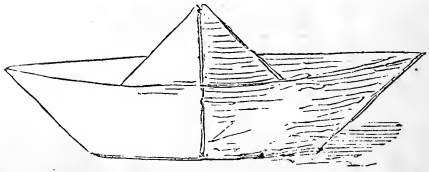
BOY'S OWN TOY-MAKER.

Paper Toys.



An endless source of amusement may be obtained by the use of the common scissors and a piece of paper. Forms of every variety can be cut out in this way; figures, animals, birds, trees, and other objects can be imitated, so that with a little practice the eye becomes familiar with the shape of each, and, as it is very quickly done, it is little or no tax on the patience of the juvenile operator. It has also the advantage of being inexpensive, as the materials cost little or nothing; old newspapers or any waste pieces of paper will do to practice upon, and toys can be made in great variety for the amusement of your young friends in the long winter evenings.

PAPER BOAT. No. 1.



CUT a piece of white writing paper, but not of too stiff a quality, six inches by four (fig. 1); fold it to the dotted line *a*, making exactly one half when folded to *c*; then the corners *b b* are to meet in the centre (fig. 2); turn down the two sides *d* forming the dotted lines *e*, take the two sides between each finger and thumb, in the left hand, and with the right pull it out until

Fig. 1.

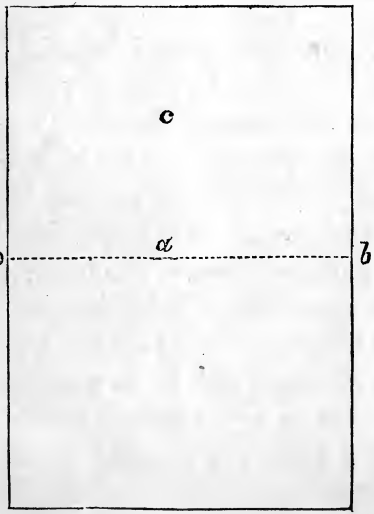


Fig. 2.

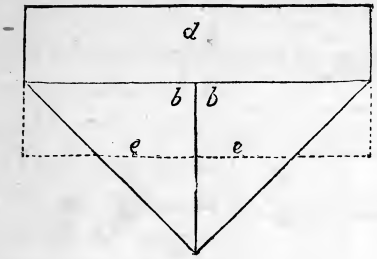
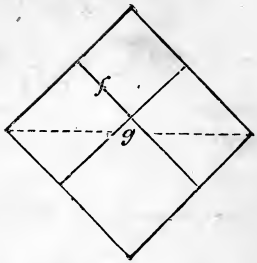


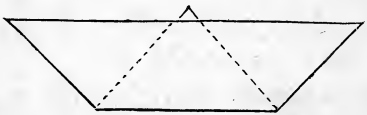
Fig. 3.



it forms fig. 3, taking care to turn over the corners at dotted line *e;* turn down the two top lines to dotted line *g*, pull out the sides again, as before, to make fig. 4; *a a* being pulled out as before described, taking care not to press the inside, it will form the boat, fig. 5.

Fig. 4

Fig. 5.



PAPER BOAT. No. 2.

TAKE a piece of writing or cartridge paper the size of a double square, fold it in the middle lengthways (fig.1), turn up the two corners to dotted lines *b b*, and turn down the two upper edges from *c* to the remaining dotted line *d*, doubling in the ends *e e* to form (fig. 2); before opening it out pierce five small notches for the seats *a*, at equal distances, and between these again cut out the small square places for the rowlocks for the oars. Open out the inside, and form the seats (fig. 3) of pieces of cardboard or stiff paper, to fit the shape of the boat, the two end ones being made to fill up the corners.

Fig. 1.

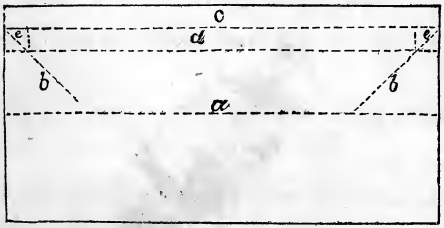
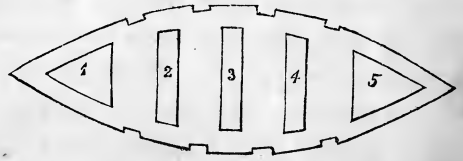


Fig. 2.

Fig. 3.

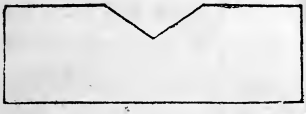


The Oars (fig. 4).—Fold a piece of paper the length of the bottom of the boat, five times, cut out the shape, double over to the dotted line, which will give the oar greater firmness, and also improve the shape.

Fig. 4.

To imitate water, take a long slip of paper, and folding it eight times (fig. 5), cut out the centre piece, crumple up the paper altogether, and open out in a line the places for the boat to rest upon.

Fig. 5.



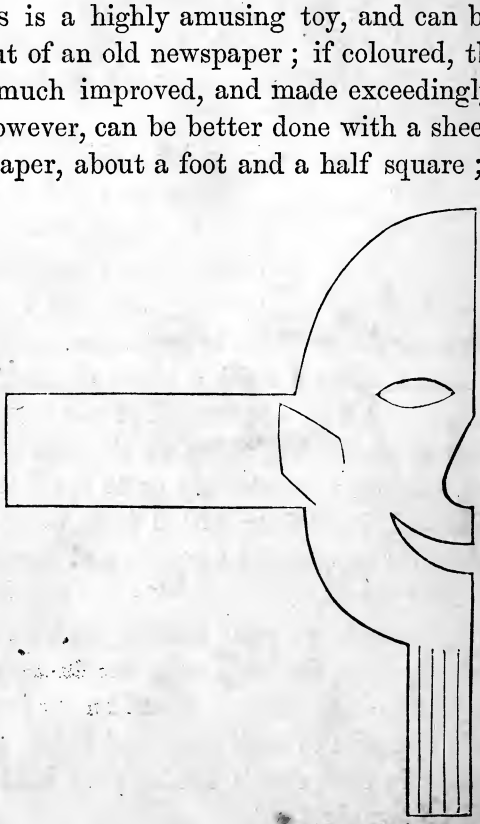
The Men (fig. 6).—Fold a piece of paper five times, about half the length of the boat, cut it out to shape, beginning at the foot on the right, cutting continuously on to the left. When finished, bend from dotted lines to sitting posture, arms brought forward, and hands turned down to hold the oars.

Fig. 6.

Having completed your cutting out, and placed your boat upright, fix your men one on each seat at opposite sides to each other. Place an oar in the rowlock again opposite to each man, and fixing an oar in like manner in each man's hands, your boat with its crew will be complete.

COMIC PAPER MASK.

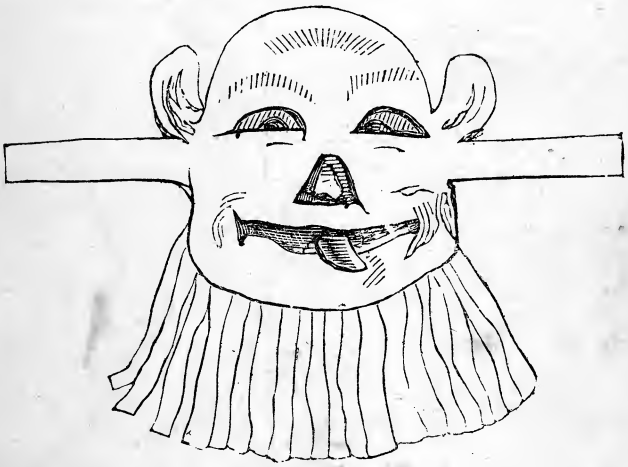
This is a highly amusing toy, and can be easily made out of an old newspaper; if coloured, the effect will be much improved, and made exceedingly funny. This, however, can be better done with a sheet of cartridge paper, about a foot and a half square; having



folded it double (fig. 1), cut out the eyes, nose, and

mouth, and round the ear; for the beard, fold the bottom portion four or five times, and cut it in long slips, open out, fix the two long side ends round the head, and by rolling the eyes, and moving the tongue about from side to side, you will find it give a most comic and grotesque appearance.

Fig. 2.



PYRAMIDICAL HAT.

TAKE a piece of paper the size of two squares (fig. 1), double it to dotted line *a*, turn the corner *b* to *c*, and the corner *d*, the same way to the other side ; then turn down the piece *e* to the dotted line *f*, and pull it

Fig. 1.

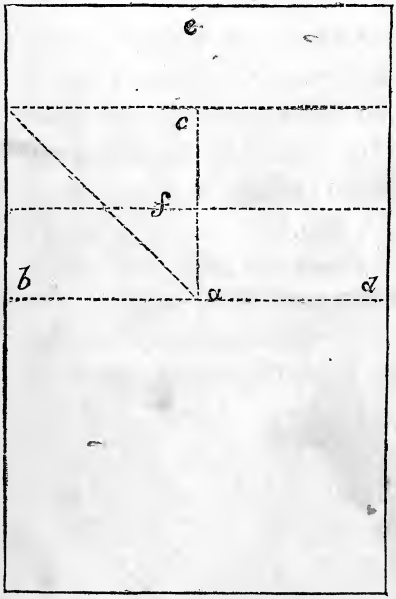
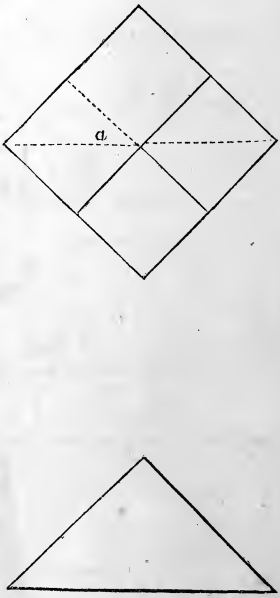
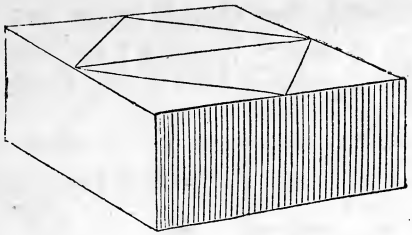


Fig. 2.



out to a diamond shape (fig. 2), taking care to fold the corners nicely under each other ; turn down the top piece to the dotted line *a*, and the hat will be finished.

PAPER BOX.



TAKE a piece of paper about six inches square, fold it to dotted lines in fig. 1, after this the four corners meet in the centre (fig. 2), which will give the square as dotted lines, each fold to be firmly pressed; then at each turn fold again to the corners the centre of the outside dotted lines, to form fig. 3. Fold the corners again to

Fig. 1.

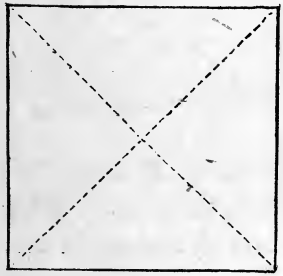
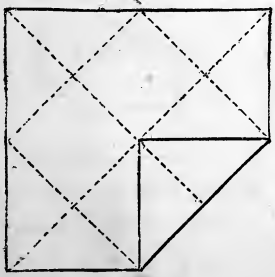


Fig. 2.



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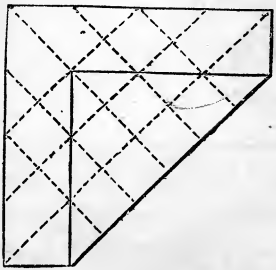
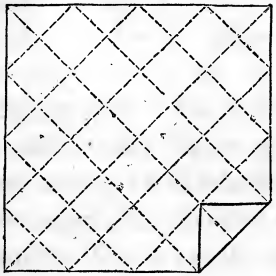


the outer dotted line (fig. 4); cut out the pieces marked 1, 2, 3, 4, 5, 6, 7, and 8; cut through all the black lines, being very careful not to touch the dotted

Fig. 4.



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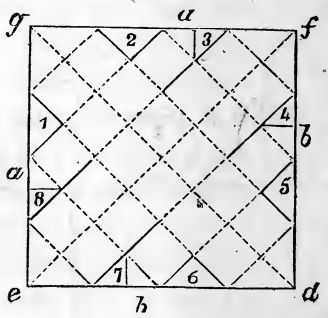


lines. Fold over the corners to form fig. 6, insert this in the opposite sides of the box *a a*, these again being inserted into *b b*, insert again *c* into *d*, and again into *f*, which will form the box, fig. 7.

Fig. 6.

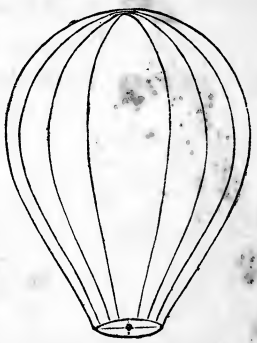
Fig. 7.

FIRE BALLOON.

PROCURE a few sheets of well woven tissue paper, and cut out the gores (fig. 1); paste these carefully together, making in all fourteen strips; look carefully over the surface, and see that there is no slit or hole left. Fig. 2: cut the bottom end equally off all round, take a piece of thin wire and make it to a circle the size of the neck of the balloon, then have two cross pieces a little bent in the middle to hold a piece of soft cotton, which must afterwards be dipped in spirits of wine, the circular wire being then pasted on to the bottom of the balloon.

Fig. 1.

Fig. 2.



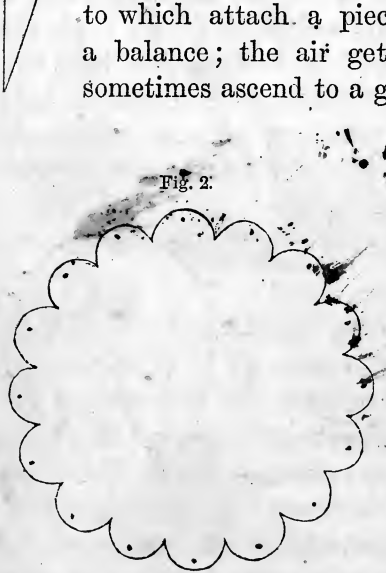
To inflate the balloon, some one must hold it up by the top, and having thoroughly saturated your piece of cotton, place in the centre of the wires and set fire to it, being very careful not to set fire to the balloon; when the air is well heated within, the balloon will rise to a great height, and in a dark night will have a very fine effect.

PARACHUTE.

A SQUARE piece of paper folded four times will form fig. 1; then with a pair of sharp scissors cut out to dotted line, pierce a hole through all, open out, and having placed threads through each hole, tie them all round, and bring the remaining ends of the threads down to a point, to which attach a piece of cork or paper as a balance; the air getting under them, they sometimes ascend to a great height.

Fig. 1.

Fig. 2.



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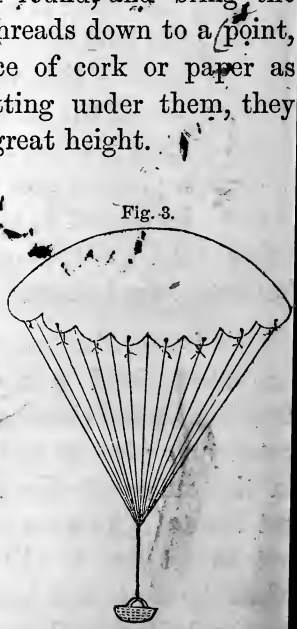


KITE.

KITE-FLYING is a most popular game with all boys. It is highly exhilarating, and ought to be encouraged by every means, as a healthful and innocent recreation. We are indebted, it is said, to the Chinese for this invention, and to this day it is one of their most popular pastimes. The kites sold in shops are made to sell, but are not necessarily warranted to fly; any boy, however, by following our directions, will be able to make one that will.

First Kite.

Take a common sheet of writing paper, double it down the centre, and cut out fig. 1; prick out two small holes for the belly-band, open out, and bend outwards the top part to dotted line (fig. 2); to fix the belly-band, tie a knob or small piece of paper to each end of the thread at the back of the kite, to prevent it running through the holes. As this is only a small kite, strong thread will be found the best to make the tail of, as well as to fly it with; the tail ought to be about fifteen times the length of the kite, and one piece of paper at the extreme end will be sufficient to steady it; * care must be taken to tie the thread to the right place on the belly-band, as a great deal of the success of its flying will depend upon this.

Fig. 1.

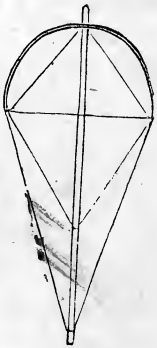
Fig. 2.

Second Kite.

Kites made with a lath and bow can be made to any size, by pasting two or more sheets of paper

* If the wind is strong, more weights must be attached to the tail.

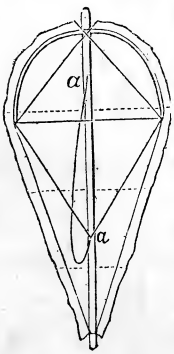
together; an old newspaper will answer the purpose as well as anything, unless you wish to colour it afterwards, in which case it ought to be white; but first you must procure a straight lath of pine, the width and the thickness of course must depend upon the size; shape it to a point at the top, notch a small piece on each side about an inch from the top, and also at the bottom, the former to tie the hoop to, and the latter the string to paste the side and ends of the paper over.



The Bow.—This can be made of cane, but the best thing is a hoop. Thin it down to about the thickness of a common cane, balance it on your finger, and then fix it at that point to the top of the lath with string; having cut a small notch at each end of the hoop, fix the string therein, and carry it down to the lower end of the lath, tie it there, and again continue the string up to the opposite side of the hoop, but before fixing with a knot, be sure that your skeleton is equally balanced on both sides; this done, secure the knot, and carry the string to the opposite end of the bow, taking one turn round the lath in its way; from this point carry on the string to the top of the lath, and again to the opposite corner of the bow, fixing

it there; from there continue the string a little more than half way down the lath, and after securing it there, carry up the string again to the other corner of the bow; fix it there, and the frame-work of your kite will be completed.

To paper the Kite.—Having pasted your paper to the size you require, lay the frame upon it, and with a pair of scissors cut about an inch outside of all to the shape; afterwards paste the outer portion all round, and fix it first over the bow, and then down each side; allow it to dry, and then drill out two holes for the belly-band—the upper one should be about one-fifth of the length of the kite from the top, and the other rather more than the same distance above its extremity.



The Belly-band.—Insert the end of a piece of string into each of the holes *a a*, and tie them in knots on the back part of the lath, taking great care not to make it too full or too narrow. The next important thing is to fix the string to the belly-band, and when this is done you next put on the

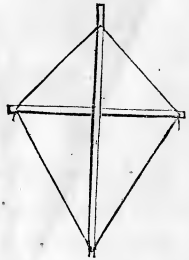
Tail.—This should be about fifteen or sixteen times the length of the kite; slips of doubled paper about four or five inches long must be tied to it by

noose knots, about four inches apart from each other, with a little larger one or a tassel at the end.

Wings may be attached to each corner of the bow, but they do not at all improve its flying capabilities. They are made of pieces of paper folded together, and cut up from the bottom in strips.

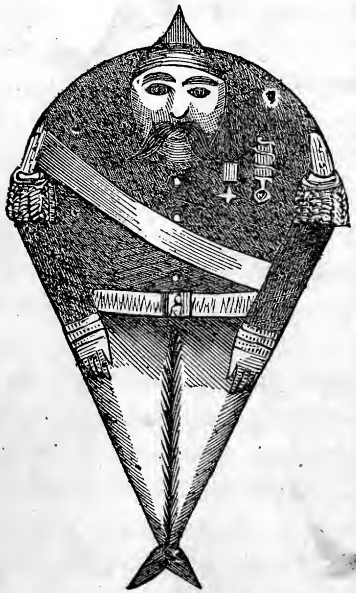
The Cloth Kite

Has some advantages over one made of paper, as not being so soon spoiled by the wet. Calico or silk is sometimes used, but the best material is very thin gutta percha cloth. The frame is made of two cross pieces placed at right angles to each other, and secured with string from corner to corner, over which the material is sewn, and fastened by quilting along the string. When finished, the whole may be detached from the laths, and these being separated can be easily packed away in a portable compass.



The Officer Kite.

Toy-makers generally paint their kites with a few daubs of red or blue, without the least attempt at design; but if you wish to paint your kite, here is an officer that will answer your purpose. It must be all dashed in very boldly, for when the kite is far up very small work upon it would be entirely lost; the coat may be painted red or blue, the face full crimson, and the epaulettes, &c., yellow, or gold tinsel if you happen to have any.



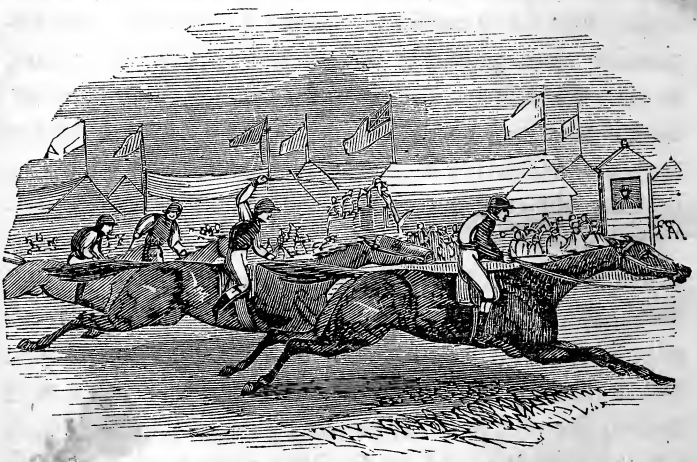
Note.—The thickness of the string to be used will of course depend upon the size of your kite.

Cardboard Toys.

LIKE paper toys, cardboard is a material by which almost any thing can be imitated; but as it is more expensive than paper, it will require a little more care, so that what is cut out should be done with a purpose, that it may not be cut to waste. Outside objects are most conveniently cut out with a pair of stout scissors, holding the card as already described for paper cuttings; the smaller pieces inside, such as windows of a house, &c., are better accomplished with a sharp-pointed pen-knife, and a flat ruler; a parallel ruler with a brass edge is the best, but any other straight line that you can hold firm on the card with the left hand will answer the purpose. When any portion is cut out with a pen-knife, it ought to be done upon a piece of flat board, to prevent cutting the table. Cardboard has many advantages over paper; solid objects can be formed and put together, specimens of which, with others, we propose giving; but as the Publishers of this book have already issued a useful and instructive work* on the subject, we refer our young friends to it for further information, should it be required.

* Home Pastime; or, The Child's Own Toy-maker.

THE RACE.



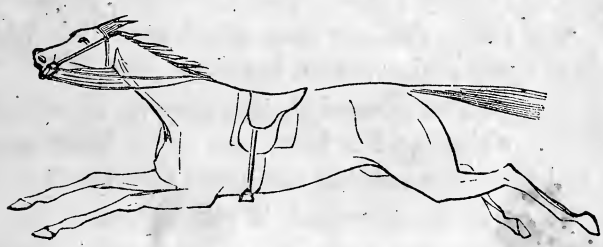
CUTTING out objects in cardboard may be done to any extent, according to the skill and ingenuity of the maker: such as a farm-yard, with its pigs, cows, poultry, &c.; a circus; or, in fact, almost any thing can be successfully imitated with the common scissors and cardboard. We shall only give two examples in this style—a Race, and a Fox Hunt—and other objects will afterwards suggest themselves.

It will be as well not to attempt too much in the

first essay, but confine yourself to three horses and riders. The outlines may be drawn out in pencil, but with a little practice you will soon be able to cut them out by the eye at once.

The manner horses run at full speed is so much alike, that one position will do very well for all your horses: the head and neck well forward, the ears back, the tail a little erect, and all the legs well stretched out. Cut out with a pair of short stout

Fig. 1.



scissors, commencing at the outer hind foot, continuously round till finished, marking the feet and legs as carefully as possible.

Having cut out the horses, you can prick out the form of the saddle and saddle-cloth with the point of a pin, as well as the eye and nose of the horse, and the part of the bridle on the horses' heads; or, if you prefer colouring them, you can do so, making one

horse brown, another black, and the other chestnut; the rein may be put through the mouth of the horse with a needle, and formed of brown thread.

The Jockeys in racing, like the position of the horses, are also much alike; they sit with their knees close to the saddle, the body a little forward, and mostly with both hands holding the bridle (fig. 2); this attitude will do for the first and third rider. Cut out, beginning at the heel of the foot on the right hand side, and round to shape, taking care not to cut further between the legs than the dotted line, which will make him sit his horse properly.

Fig. 2.

The Second Jockey may be represented whipping his horse, his right hand raised up, and the other holding the bridle (fig. 3). Having cut out as before described, if you wish to paint them you can make No. 1, black cap and red jacket; No. 2, blue and yellow striped jacket and blue cap; No. 3, yellow body, blue sleeves, and black cap.

Fig. 3.

Having so far completed the race, you can try the effect on the table by placing the men on the horses, but if you wish to make a more finished job of your work, you must procure a piece of flat board, and cut

out the *Rails* (fig. 4). Take a strip of cardboard about half the height of the men, and cut out with a penknife and scissors, and by joining the ends together, make it to any extent you think proper ; to fix them

Fig. 4.

you must split the ends to the dotted lines *a*, and separating them will make them stand upright.

The Spectators.—Fold a piece of paper four times the size you require your men, and cut out as before described in fig. 2 ; open out and place them outside the railings in rows (fig. 5).

The Winning-post, or stand, can be made of cardboard (fig. 7), and made to stand the same as the rails (fig. 4); place a paper man inside.

Fig. 5.

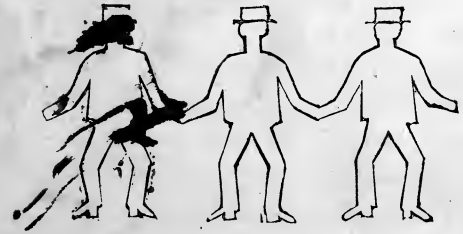
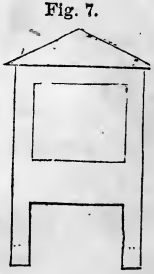
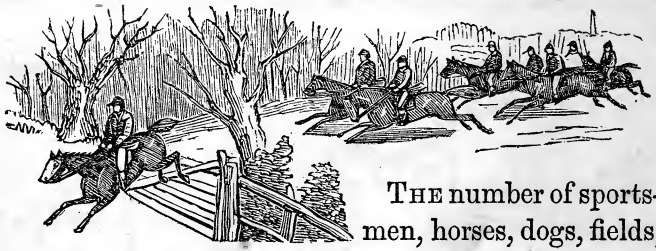


Fig. 7.



THE FOX HUNT.

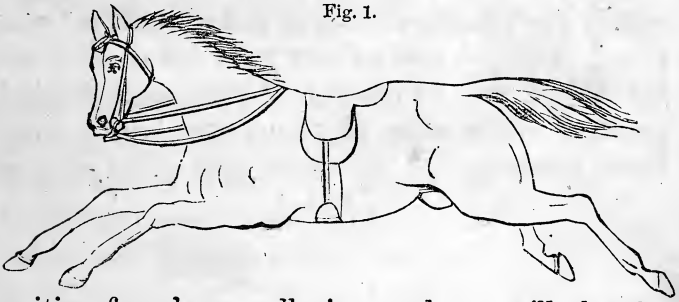


THE number of sportsmen, horses, dogs, fields, trees, gates, &c., can be carried out to an unlimited extent, according to the skill and perseverance of the artist,

As it is in nature with a real fox hunt, the more that is in it the more the excitement and pleasure, so with your toy hunt, the more you make the better yourself and friends will be satisfied and pleased with the exhibition.

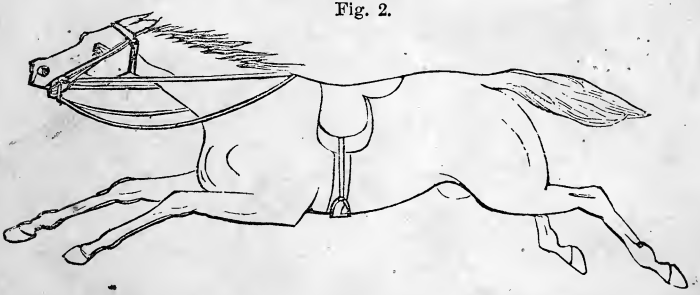
Horse running (fig. 1). This is the most common

Fig. 1.



position for a horse galloping, and you will therefore require more of this than any other; it can be varied

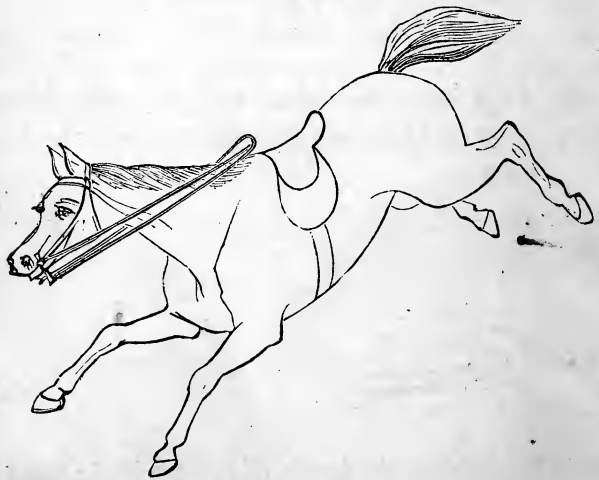
Fig. 2.



a little by making the heads of some a little more forward (fig. 2). Of these two positions you will require

to cut out, according to the following directions, from eight to twelve:—Take a piece of cardboard, and commence by cutting out, beginning with the right hind leg, and round continuously till completed, taking care to make the feet and legs as good a shape as possible. The eye, saddle, saddle-cloth, and bridle on the head, may be pricked out with a pin, and when all are completed they will make a very good set as they are: but if you wish to make your hunt more finished, you may colour some of your horses brown, others black, chestnut, &c.; the saddle-cloth inside blue, the

Fig. 3.



saddles light brown, and the bridles can be made of

thread. The two positions of horses already described will do for almost all kinds of straight or field running, but you will require some in the act of leaping over gates, hedges, &c., when both your horses and men will require a different attitude.

Leaping (fig. 3). This is a very good position for a horse in the act of leaping; it must be cut out as described in fig. 1 and 2, and you had better cut out four or five like it.

Huntsmen (fig. 4). To make a rider for your horses which you have cut out as fig. 1, the most natural attitude will be for the huntsman to be holding his horse with both hands, the body a little forward, and the knees firmly sticking to the saddle. If painted, all the coats must be red, cap and boots black, tops yellow, and neckties light blue.

Fig. 4.

Fig. 5.

First Huntsman (fig. 5).—The whipper-in or huntsman may be a little in advance of all the others, and even before some of the dogs; he should be represented in the act of cheering them on, his left hand erect, holding his horn (trumpet), and the other holding the bridle. You will, however, only require one figure in this position, riding a galloping horse (fig. 1).

Rider (fig. 6). This attitude is for your leaping horses (fig. 3); he is holding his horse well up to assist it over the gate or fence; you will also require four or five in this position.

Fig. 6.

The Fox (fig. 10.) The remarks we have already made respecting the running of horses will also apply to the fox and dogs, for they vary but little in their action; there is, however, a marked difference in the head and tail of Reynard, which must be carefully attended to.

Fig. 10.

Fig. 7.

The Hounds (fig. 7). The one we have illustrated is the most natural, and of this you will require at least ten or twelve; if coloured they must be either black and white, or brown and white, in patches of every kind.

Hounds (fig. 8). This position will give a little variety to the pack, but as he does not look so thoroughly up to his work, you will not require so many, say, five or six. If you wish to represent nothing but a straight run, you would not require any other attitudes for your dogs, but you will want to give spirit to your hunt, to see some of them jumping and scrambling over hedges and ditches; here is another attitude:

Fig. 8.

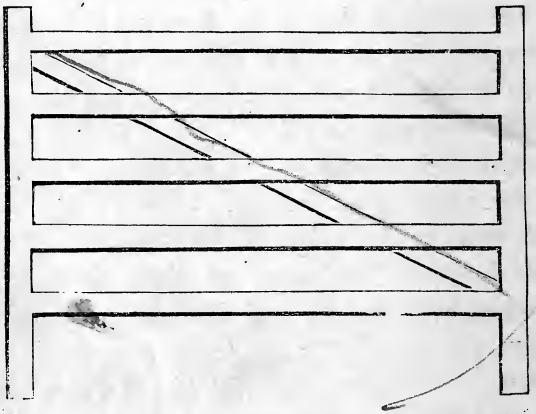
Fig. 9.

Jumping (fig. 9). Of this you will not require more than three or four.

Having cut out and coloured all as before described, you now begin to prepare your ground, which must be composed of fields, hedges, gates, trees, &c. A piece of thin pine about two feet long by six or eight inches broad, will make the best stand; the in equalities of the ground may be made of pieces of paper, cardboard, or bits of decayed twigs of trees, sand, moss, &c., and fixed with a little gum.

Gates (fig. 11). These must be cut out of cardboard, and they will not require painting; they are made to stand by splitting the cardboard up to the dotted lines, and fixing the ends with gum or paste; cut out not less than three of these.

Fig. 11.



Hedges. Procure if possible some green paper; fold it together about four or five times, and cut out to the form of fig. 13; they must be a little higher than the gates. Commence cutting out from the right hand side, holding the paper firmly between the finger and thumb in the left hand; when completed, twist the various cuttings together, and you will have a good imitation of a hedge; you can vary the sizes a little.

Trees (fig. 13).—These are also cut out of green paper, and in the same manner as the hedges, only much larger and of various sizes, also leaving more length for the trunks, and giving more shape to the outline; they must also vary in size and form. The trunks may be supported by twisting a piece of paper round the five cuttings, and fixing them to the ground with gum or paste.

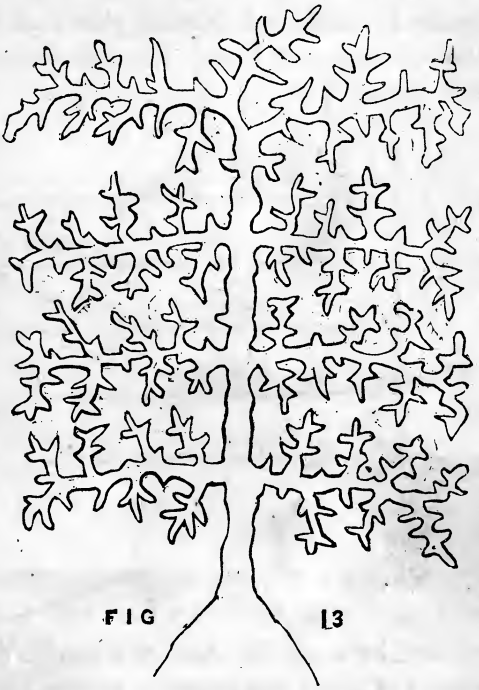
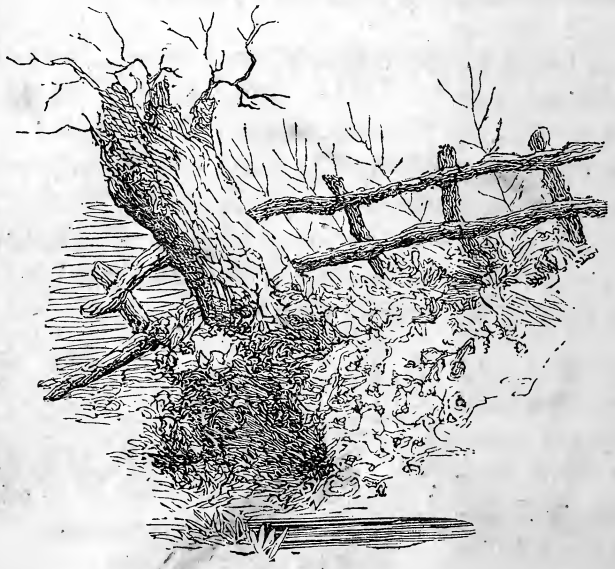


FIG 13

A village church, cottage, or farm, may be represented in the distance, according to the taste and talent of the artist. It will not be necessary to make your horses, dogs, or fox, fixtures, so that you may enjoy a fresh hunt as often as you have leisure.

Old railings, stumps of trees, and other objects, may be made of twigs, roots, and small branches of natural trees; and broken pieces of ground may be



formed by a combination of all, with the addition of pieces of stone and moss, or such other things as may suggest themselves to the taste and fancy of the maker.

THE THAUMATROPE.

THIS is a very pretty philosophical toy; its name is derived from two Greek words, one of which signifies *wonder*, and the other *to turn*. It is founded upon the well-known principle in optics, that an impression made on the retina of the eye lasts for a short time after the object which produced it has been withdrawn. When you have made one you will understand it better than by any written description.

Fig. 1.

The Boy and the Donkey.—Take a common card, or piece of cardboard, say five inches by three, on one side of it sketch a donkey running, and paint it black

with Indian ink with a lighter wash for the ground (fig. 3); and in like manner draw and paint a boy in a sitting position, on the reverse side of the card, as shewn in the cut (fig. 2). Fasten two pieces of thread,

Fig. 2.

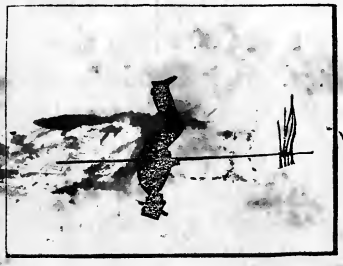


Fig. 3.

one on each side, at opposite points in the centre of the card; take these between the fore-finger and thumb in each hand, twirl them round, which will make the card quickly revolve, and the boy will appear to be riding upon the donkey as in fig. 1.

A rat in a trap, a bird in a cage, a cricketer and bat, and numerous other subjects may be produced upon the same principle.

CARD RACKS.

Fig. 1.

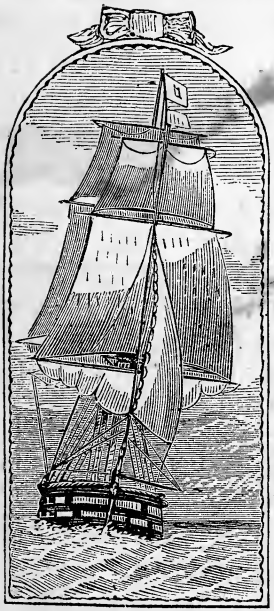
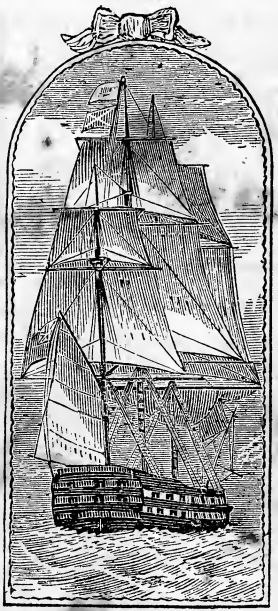


Fig. 2.

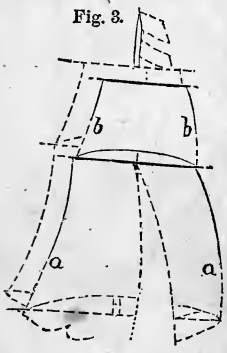


If these are carefully made and neatly coloured, they will make something better than mere toys; they will serve as appropriate presents to distant friends, or as ornaments to decorate your own room. They will

be also useful to hold any loose cards, or letters, if hung up on each side of the mantel-piece.

Front view of a Ship (fig. 1).—Take a piece of clean cardboard about twelve inches high by five broad, copy the outline carefully in pencil, and commence colouring the upper portion of the sky light blue, leaving the lights, and mix a little Indian red and darker blue for the clouds. With the same colours lay in the distant sea, making it a little greener towards the front. The shadows on the sails can be washed in with sepia, and the sails with raw umber, mixed with a little yellow ochre. The hull must be a wash of lamp-black and a little Indian red, and the bottom of the ship copper color, the flags red and blue, the yards black, and the ropes and rigging touched in with sepia. When these are finished, cut out carefully on a flat board the fore-topsail (fig. 3), along the top of the yard and down the sides to *a a*, and in the same manner the fore-top-gallant sail, to *b b*, being careful not to cut the dotted lines.

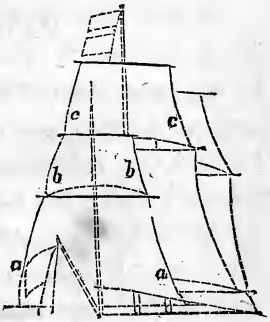
Fig. 3.

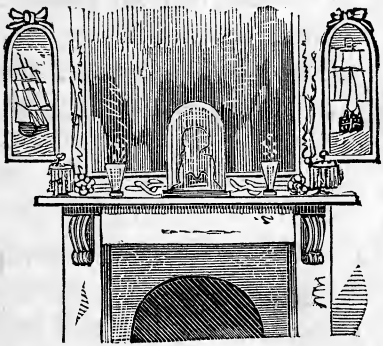


In the same manner as before described for drawing and colouring fig. 1, proceed to finish fig. 2 ; the only difference to be attended to particularly is in cutting

out the sails, which must be as follows : cut out in the same manner as fig. 1 the mizen-topsail to fig. 4, and the mizen-top-gallant sail, also the main-top-gallant sail to *c c*. When this is finished, paste on or gum a thin strip of gold-edged paper round the outside of all edges, and finish with a bow of coloured ribbon at the top of each.

Fig. 4.

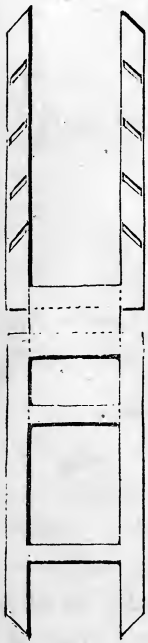




PAIR OF STEPS.

TAKE a piece of cardboard, and draw out the pattern in outline, say one-third larger than fig. 1, and commence first by cutting out the small holes for the steps with a sharp pointed penknife, and in the same way the squares inside; the outside can be cut out with the scissors. Having cut out the shape, cut *half* through the card on the dotted lines, and bend over first for the top, and afterwards for the two sides.

Fig. 1.



The Steps.—Cut out four pieces of card the shape of fig. 2, also one-third

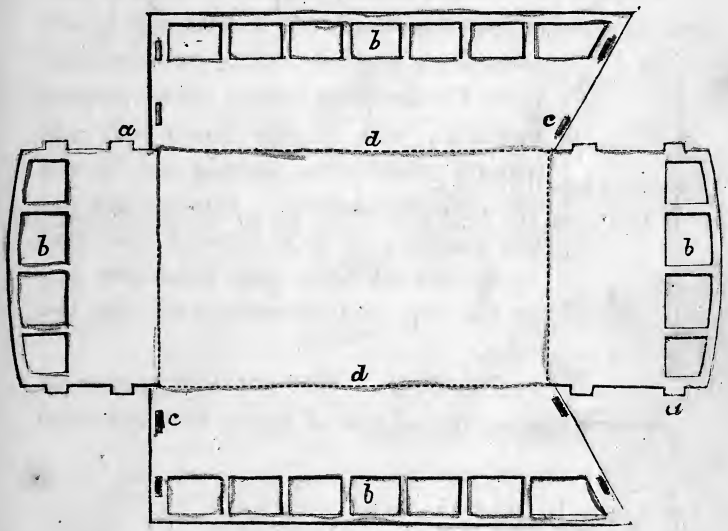
Fig. 1.

larger than pattern; having done so, insert the narrow ends into their respective holes, and you have a pair of neat little steps.

HORSE AND CART.

DRAW out on a piece of cardboard, one-third larger than the pattern* (fig. 1), and cut out the out-

Fig. 1.

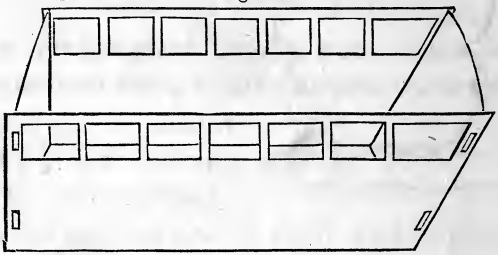


side, taking care to leave the small projecting pieces on the end and front, *a* ; afterwards with the point of a penknife cut out between the rails on each side, *b*, and also very carefully the four small holes on each side, *c* ; next cut half through the dotted lines, *d*,

* All the other parts must be in the same proportion.

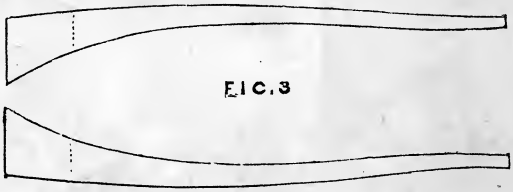
and bend over the sides and ends to form the body of

Fig. 2.



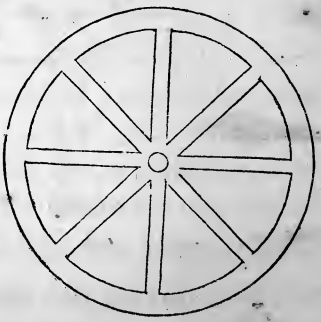
the cart (fig. 2), by inserting the projecting parts *a* into the small holes *c*.

The Shafts (fig. 3).—Cut out to shape, and with



a little gum or paste fix them on to the bottom front of the cart, to the dotted line.

Fig. 4.



The Wheels (fig. 4).—These must be drawn out first with a pencil. The outsides can be cut out

with the scissors, but the insides must be done with the penknife.

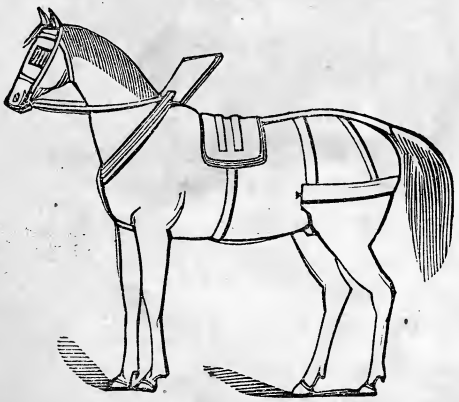
Axle-tree.—Get a piece of wood and cut it to the shape (fig. 5), and with gum or paste fix it across the middle of the bottom of the cart (fig. 1); when it is perfectly dry put on the wheels, and to keep them on you can cut out a small cap (fig. 6); the hole in this should be made first, and the outside cut round with scissors.

Fig. 5.

Fig. 6.

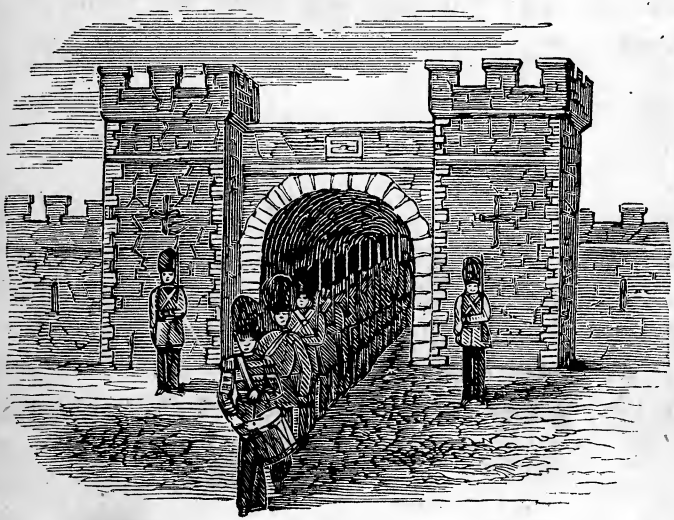
Your cart being now completed you will no doubt want a horse for it (fig. 7.) This had better also be drawn out first with a pencil, the harness put in with pen and ink, or the whole, as well as your cart,

Fig. 7.



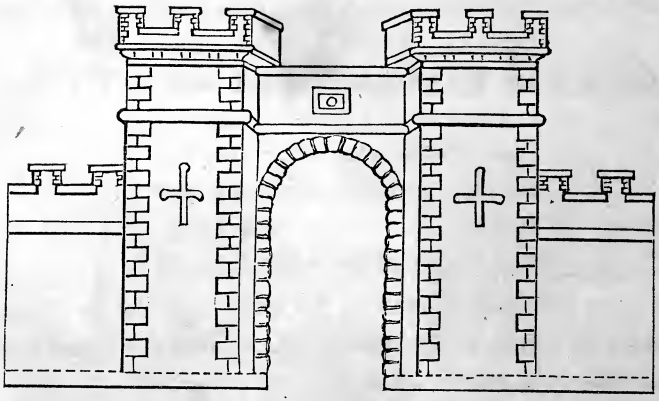
colored according to your fancy. Having cut out the horse, by dividing the legs a little, he will stand firmly, and by fixing a piece of thread to each of the shafts, and over the horse's back, you will find it support the cart; you may also make the bridle of thread.

SOLDIERS MARCHING OUT OF A FORT.



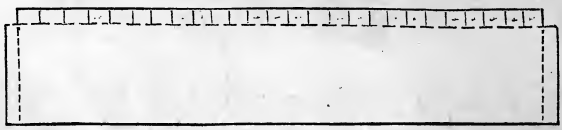
DRAW out in pencil on cardboard the outside of the fort, and color it in imitation of stone work. When completed to your satisfaction, cut out the outline with a pair of scissors, and the loophooles and gateway with a penknife to the form of fig. 1; cut half through the dotted line at the bottom, and turn over to make the support.

Fig. 1.



The Entrance.—This is also made of cardboard, and colored in imitation of stone-work inside, but with a shadow over the whole, to give a better effect. When done, cut out to the pattern of fig. 2, and cut

Fig. 2.

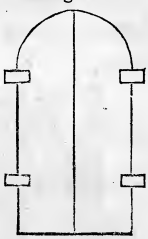


half through the dotted lines; the end turned will make the stand, the black lines being cut entirely, and the end bent over from the dotted line; bend over to the form of the gate, and paste the side of it on to the inside of the gateway.

The Door (fig. 3).—This must also be drawn on cardboard, and coloured in imitation of old oak; being done the exact size of space left open behind the gateway, cut out with a pair of scissors, and divide the door up the centre. Cut four slips of paper to form the hinges, and bending them in the centre, paste or gum one half of each to the outside of the gateway, and the other to the door; when dry, the doors will conveniently open and shut.

Fig. 3.

Fig. 4.



A Stand for the whole may be also made of cardboard, painted stone colour, to which you can paste the slip of the front, back, and sides on the dotted line of fig. 5.

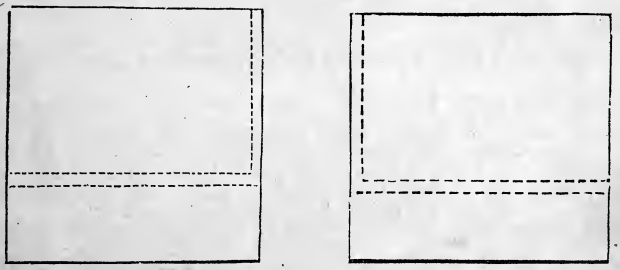


Fig. 5.

It has long been a common amusement with boys to

cut out soldiers and fix them in various positions; but we believe this is the first time that any attempt has been made to put them in motion. They must be first drawn upon cardboard, and coloured as neatly as possible.

Drummer (fig. 6).—He may be a little shorter than the others, and the coat is the only difference in his dress, having a few white bands round the arms and down the body; coat, red, trousers, dark grey, and black cap.

Fig. 6.

The Officer (fig. 7) must be about the same height as the soldiers, a sword in his hand instead of a gun, and only one belt over the left shoulder, red coat, and trousers the same as the others.

Fig. 7.

Soldiers (fig. 8) must be represented carrying the gun over the left shoulder, cross belts over the body, and coloured as before described. You will require at least six of these, or as many more as you think proper to make. Having completed the drawings of your figures, cut them out carefully with a pair of scissors, using a penknife for the

Fig. 8.

inside portions; when finished, cut two slips of cardboard long enough to stand all your figures upon, allowing an inch between each figure, and not broader than half an inch (fig. 9); turn up the feet of the sol-

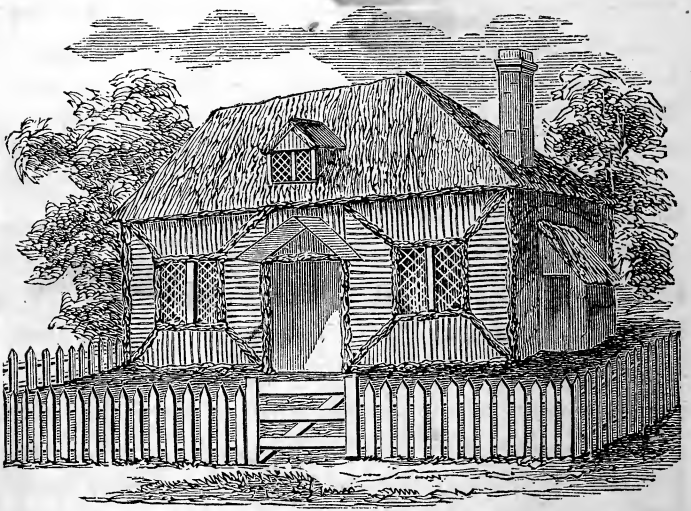
Fig. 9.

diers to make them stand, and cut several slips of cardboard the shape of fig. 10, and cut half through the middle, and bend

Fig. 10.

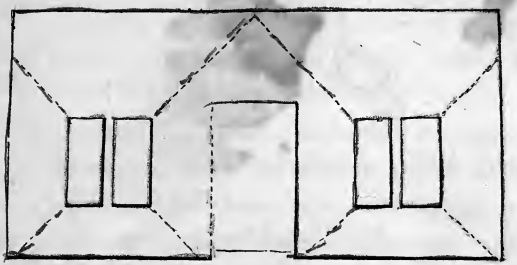
over; with a little gum or paste fix the feet of the soldiers upon fig. 9, one foot in each slip; and behind the feet fix the piece of card, half to the leg and the other half to the stand, and so on till you have placed them all in regular order; allow them to stand till perfectly dry, and then, by moving the stand forward right and left, the soldiers will have the appearance of marching. The door of the fort should be kept closed, only opening it just before the soldiers are made to march out. The manner of working the figures being kept as much a secret as possible, and the soldiers really marching will assuredly amuse your juvenile visitors. The cardboard on which your soldiers are fixed ought to be rather stout, and painted a brownish tint, to be as near the colour of the stand as possible.

RUSTIC COTTAGE.



TAKE a sheet of cardboard about the proportion of twelve inches by six, cut out the windows and round the black lines of the door, and half through the dotted lines, which will allow the door to open and shut (fig. 1); this is for the front of the cottage. For the back, cut out another piece of cardboard in a similar manner and the same size.

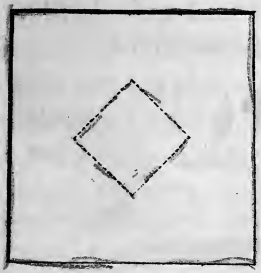
Fig. 1.

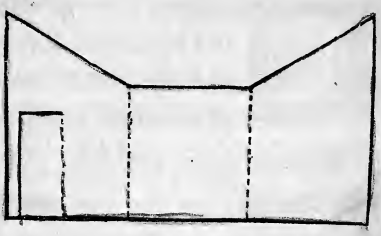


For the two ends, cut out two pieces of cardboard six inches square (fig. 2).

The Out-House. Cut out of cardboard the pattern (fig. 3), and half through the dotted lines, and bend

Fig. 2. Fig. 3.





over to shape, having first cut out the black lines of the door, and half through the dotted lines as already described in fig. 1.

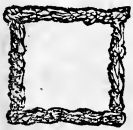
Small squares in windows (fig. 1). Cut out several slips of white paper, and paste them over the back

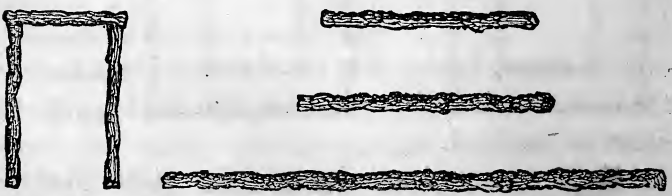
and front windows, according to pattern (fig. 4); pieces of glass can be pasted behind these, and also red or white curtains may be afterwards added, if you wish your cottage to have a completely finished appearance. Tracing paper will make a substitute for the glass, if you are not able to procure the real thing.

Fig. 4.

Before commencing with the wood-work, wash all over the front, back, and sides of the cardboard with a brown colour, to prevent any white work shewing between the interstices.

The rustic wood-work for the front. Procure a quantity of small twigs not thicker than a common quill—they must be quite dry and well-seasoned; first cut out pieces to fit the top and bottom of the windows, and afterwards the two sides, and then in the same way the top and sides of the door; and with similar pieces, but a very little thicker, fit to the length of the two sides,



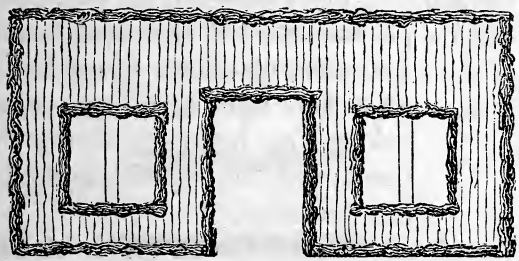


and along the bottom; also along the top, with a small

piece in the centre of the door. Having got them all to the correct size, cut off nearly one-half of the under side of all, to allow them to lie flat on the cardboard. Fix the wood-work with glue, and while the front part already described is drying, cut out in a similar manner pieces to fit the windows, door, top, bottom, and sides, for the back, and then glue them on in their respective places.

Inside of the Wood-work. Cut out several pieces of twigs, taking care that they are not quite so thick as the supports for the door, windows, &c.; split them evenly down the middle, and fitting them first carefully to the pattern, fix them with glue. Continue in like manner till the whole of the front is covered, care being taken that they fit as close and neatly as possible. The back of the cottage must next be covered in the same manner, unless youwish to save time by making all the inside pieces upright (fig. 5), instead of the same pattern as the front.

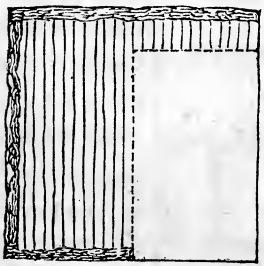
Fig. 5.



The sides or ends of the Cottage. The end on the left must be commenced by cutting out a frame of twigs first for the sides and then for top and bottom. Having previously drawn out the shape of a diamond on the cardboard (fig. 2), fix with glue to the top, bottom, and two sides; then cut out small pieces to the shape of the diamond, and fix them across the end, and fill up the remaining portions with uprights.

As the end on the right is partly covered by the out-house, it will not be necessary to cover more than the outer portion with wood-work. It must be done as already described, by fixing a piece along the top and bottom, and down the one side, and the upper portion of the right hand side, and fill up with small pieces the inside, all upright (fig. 6).

Fig. 6.



Wood-work for the Outhouse. Pieces must be first fixed round the door, and down the sides of the two ends and back, also along the bottom and top of each, and filled up with uprights in the inside.

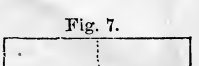
Having completed your wood-work for the front, back, and ends of your cottage, before putting them together paint the three doors a dark green colour.

To fix the house together, cut four slips of paper five inches by one, double each piece down the middle, and with paste or glue bind the side and ends together in the inside with the paper; allow it to stand quietly till dry, and then fix to the ground.

The Stand. This must be made of a thin piece of pine-board, which must be first slightly covered over with a brownish coat of paint; it should be altogether about sixteen inches long by twelve broad. The house, including the out-house, should be placed at equal distance from the ends, and close to the back, leaving room for the garden and railings in front; fix the house with slips of the paper in the inside to the walls and ground, in the same manner as before described for fixing the ends together. The out-house must next be added, and put together by pasting slips of the paper to the sides of the house and to the bottom and ground.

The Porch over the front door must next be cut out of cardboard (fig. 7); cut half through the dotted line, bend to shape, and fix with glue and thin slips of paper under the porch, and after it is dry paint it the same colour as the doors.

Fig. 7.



The Roof. First cut out of cardboard the two

ends (figs. 8 and 9), the square hole in fig. 9 being for

Fig. 8

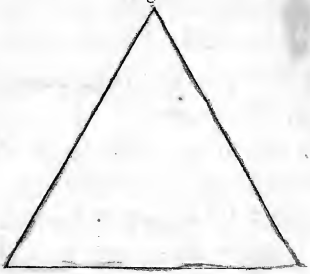


Fig. 9

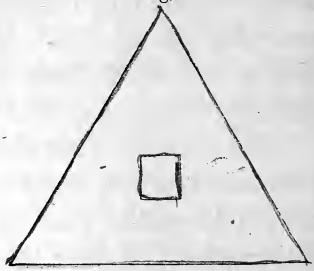
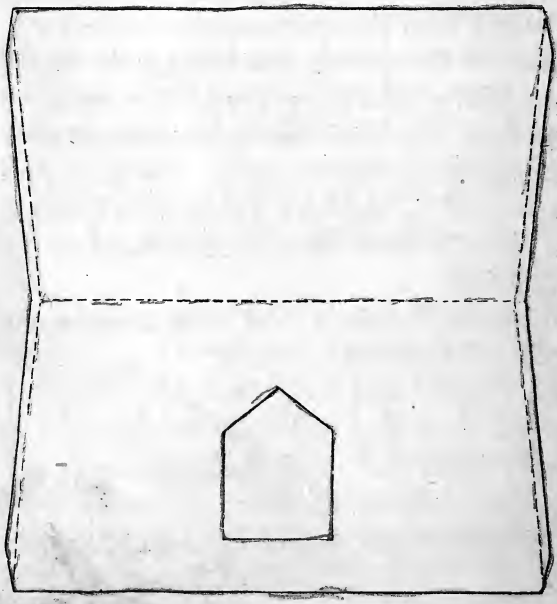


Fig. 10.

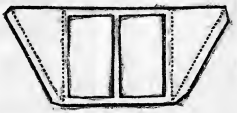


the chimney. The front and back to be cut out in one piece (fig. 10), and half through the dotted lines to get the bends; cut out the porch for the window in

front, and paste the extreme ends on the inside, to which fix the two end pieces.

Top front Window (fig. 11). Cut out of cardboard the window to pattern, and half through the dotted lines; the end dotted lines being cut on the back of the card to turn over to the front. Cut thin slips of paper for the cross sashes, as in the other windows, and paste them on to the back of the window, and afterwards paste in glass or tissue paper, as before described.

Fig. 11.



Roof of Window Porch (fig. 12). Cut out the shape, and half through the dotted lines for the front, and at the back to turn upwards the end dotted lines. Fix in the window by pasting the end pieces to the inside of the roof, and fig. 12 to the same on the outside.

Fig. 12.

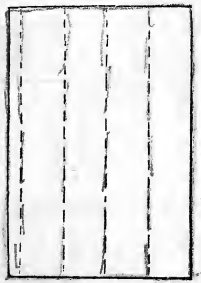
Roof of Out-house (fig. 13). Cut out the shape, and half through the dotted line, and fix the piece to the end of the house. The roof may be afterwards painted in imitation of thatch, or actually thatched with hay, or moss.

Fig. 13.

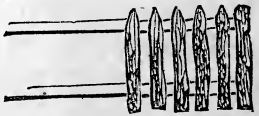
The Chimney (fig. 14). Cut out the shape, and half through the dotted lines; bend over to the square,

and fix by pasting lower extremity on the inside. To give finish, and make an imitation stone coping round the top, cut four pieces of wood the size, and fix round. Secure the chimney by pasting it to the end wall inside, before placing on the roof, which will not require fixing; but before the chimney is secured, it ought to be painted in imitation of bricks, with the stone coping at the top.

Fig. 14.



Railings in front of Cottage. These can be made in the same way as the wood-work of the house, by splitting pieces of wood, and glueing them on to two other pieces, the length you require for the front and sides; the end ones being a little thicker; they must be fixed with slips of card behind the supports. The gate in front can be cut out of cardboard. The garden may be composed of moss; and the walks of sand, small shells, &c.



BOATS.

In the British Museum may be seen the remains of a large boat cut out of the solid tree; and there is no doubt this was the manner in which the ancient Britons first constructed their vessels. In some parts of Wales and on the river Severn a sort of rude boat may still be found, called a *coracle:* it is made of wicker-work, covered with skins, and is propelled in the same manner as the canoe, by means of a paddle. For crossing creeks, lakes, or rivers they have the same advantages as the Greenlander has with his canoe, by their extreme lightness. A man could easily carry one about on his back or under his arm.

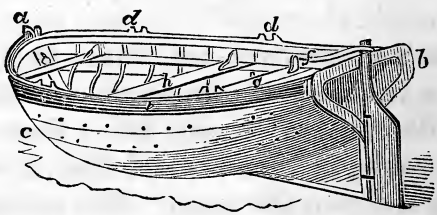
For many years both ships and boats were made very clumsy, as if strength and stowage were all that could be desired. The old bluff bow has now given way to the clipper ship, which is much longer and sharper; and for a boat the skiff or row-boat of the

present day may be taken as a model of perfection where speed and lightness are required.

Fig. 1.

Before commencing to build or cut out a boat, it will be as well to become acquainted with its component parts; but it must first be observed that ships' boats, or those used on the sea, are much higher and stronger than those used on rivers only. Here we have a ship's long boat:

Fig. 2.



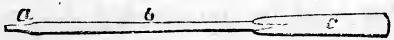
a. Bow.
b. Stern.
c. Cutwater.
d. Rowlock.
e. Thwarts or Seats.
f. Tiller.
g. Stern-sheets.
h. Fore-sheets.
i. Whale-streak.

In boats made for racing there is a board fixed across the boat for the feet of the rower, called a *stretcher*.

Boats with two rowlocks opposite each other are

called *sculling boats*, and are propelled by a pair of light oars called *sculls;* when the rowlocks are not opposite each other it is called a *pair-oared boat;* if with two in the middle, opposite each other, it is called a *randan;* when there are four rowlocks, none of which are opposite each other, it is called a *four-oared boat;* and so on, up to ten.

Fig. 3.



Scull or Oar.

a. Handle. *b.* Shoulder.

c. Blade.

A scull is a small oar used with one hand, and requiring a pair, as in the case with oars—one being placed in the rowlocks on each side. Oars are used with both hands, and a pair-oared boat of course requires two oarsmen, and so on. The *strokesman* is the rower nearest the stern; the *bowman* the one nearest the bow; and the *coxswain* the one who steers the boat. The *painter* is a rope fixed to the inside of the bow to fasten the boat to the shore. Having become acquainted with the various parts of a boat, we shall now give directions how to make one or two, and afterwards illustrate the different kinds of boats, and their style of rigging, &c.

To make a small Pleasure-Boat.

Fig. 4.

Having procured a small piece of soft wood, perfectly free from knots, say seven inches long by one-and-a-half square; mark out with a pencil the keel, stem, and stern, and with a knife cut along each side and down the stern; gradually cut away the corners to make the shape of upper portion, and then cut away the sides, making fig. 7, the bottom of the boat, and afterwards finish off the stern (fig. 8).

Fig. 5.

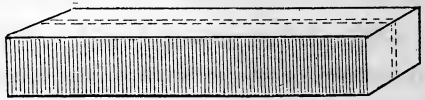


Fig. 6.

Having completed the outside work, you next scoop out the inside with a small gouge (fig. 9), leaving a small ridge to rest the

Fig. 7.

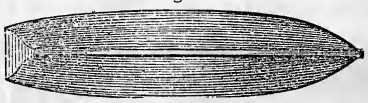


Fig. 8.

seats upon; the stern must project a little above the gunwale, and the sides must have a slight sheer. Cut out the rowlocks, and your boat will be ready for the seats (fig. 11). Cut out five pieces of wood about the breadth of fig. 11, and fix one in the centre and the two others at each end; the one at the bow filling up the corner. Drill or bore a small hole through the middle of the second seat for the mast, and opposite it a corresponding hole in the bottom of the boat, and with a little sand-paper polish up the whole.

Fig. 9.

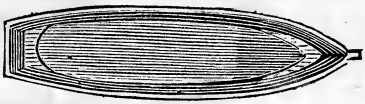


Fig. 10.

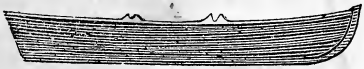
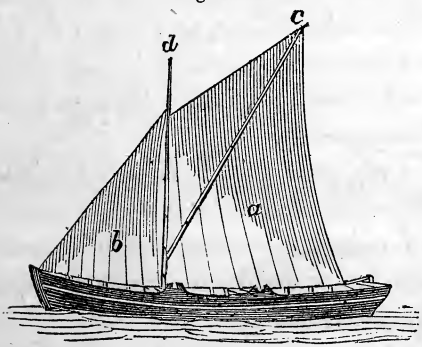


Fig. 11.

Fig. 12.



Sails and Rigging.—A boat of this description may have one or two sails: *a* is called the spritsail, *b* the foresail, *c* sprit-

sail boom, *d* the mast. The ropes which hold in the sails are called the main-sheet and the fore-sheet.

The Rudder (fig. 13).—Cut out a small piece of wood to the size; take a small pin, and having cut it in two, bend it to this shape, and stick the sharp point into the upper part of the rudder. Cut another pin in two, double it, and drive the two points into the upper part of the stern of the boat, fitting the hinge of the rudder into it. A small hole may be made through the lower part of the stern of the boat, and opposite it also in the rudder, through which a thread may be tied to keep it in its place. The thick end of a pin, bent a little, will make a very good substitute for a tiller.

Fig. 13.

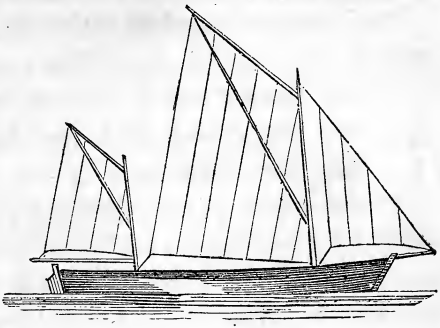
Fig. 14.

Fig. 15.

To paint your Boat.—The whole should first have a priming of white or lead-colour, and when this is dry, paint the inside green, the seats and sides of the boat black, and the bottom green, and then you will have a very nice pleasure-boat.

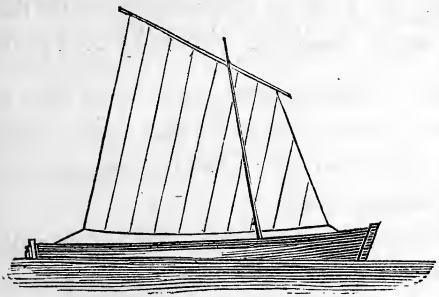
There are various styles of rigging adapted to sailing-boats; but the one illustrated in fig. 12 is preferable to all others for juvenile sailors, being much easier to manage, and not so liable to capsize, as when a boom is used to keep out the sail.

There are many different kinds of rig, though that in fig. 12 is the most common. Some of the watermen on the coast of England use a kind of deep boat, rigged with two spritsails and a jib; they sail very fast, and go out to the ships at sea in all kinds of weather.



Ships' boats, and those used by the coast-guard against smugglers have what is called a *lugsail*, or *squaresail;* it is more difficult to manage than the spritsail, and ought therefore to be only used in the hands of experienced sailors.

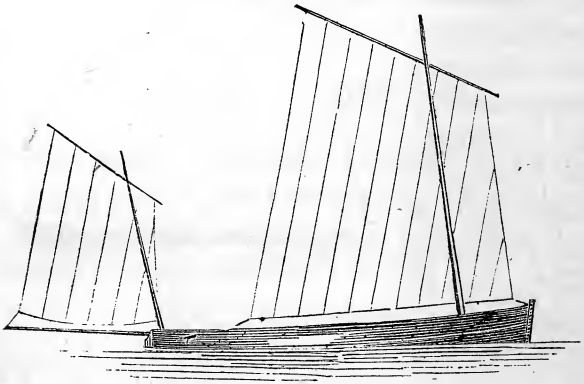
Lugsail.



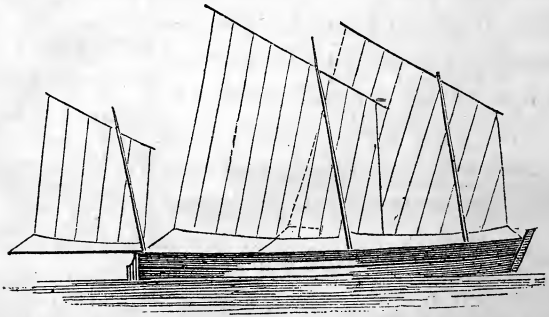
Boats on a large scale, rigged with two or more sails of this kind, are much used by the fishermen at Margate, Deal, &c. In the hands of skilful seamen

they are excellent sea-boats, and their crews have saved the life of many a shipwrecked mariner.

Boat with two Lugsails.



Having noticed the various characteristics of different boats, we shall continue the subject to the



making of a yacht, and the rigging and sailing of the various classes of vessels.

CUTTER OR SLOOP.

THERE is nothing in which the professional toy-makers have more improved than in their boats and ships. It is not long since the most clumsy and shapeless things were sold in shops and bazaars, generally without form or design; but within the last few years the trade has so much progressed in this particular branch, that the tiny craft may now be seen in all the best toy-shops, executed in many instances to scale, and perfectly correct in all their proportions. Yachts, schooners, brigs, ships, and even steam-packets, with their machinery, can now be purchased complete; but the design of the present work is to teach boys to make their own toys, whereby they will gain both amusement and instruction, and save their money.

With the cutter or sloop-rigged yacht, and the uses of its various parts every boy would do well to become acquainted, as he will learn practical information that will always be of use to him through life.

To commence, you must procure a nice soft piece of

wood, as free from knots as possible, say about fourteen inches long by five inches square ; take a ruler, and mark with a pencil two lines along the centre of the bottom for the keel, and up the end for the stem (fig. 1), as in the dotted lines; cut along outside these with a sharp knife to an equal depth of half an inch, then with a gouge scrape away the wood on both sides forming the centre, or midships, first, and gradually cut away to the shape of fig. 2. The midships (fig. 3) being first completed, you work away next to fig. 4 for the bow and stem, and then to fig. 5 for the stern; these latter portions must gradually taper down towards the keel ; the latter is called the sheer, and the former the cutwater ; in yachts and clipper ships these are much finer than in other ves-

Fig. 1.

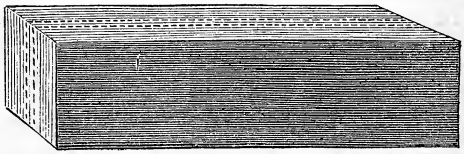


Fig. 2.

Fig. 3.

Fig. 4.

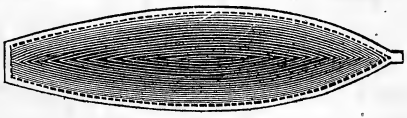
Fig. 5.

sels. Having cut out the shape to fig. 6, you must now carefully finish off the model, taking care that each side is perfectly true. The stem and stern must project a little above the gunwale, with a slight curve in the centre or midships to improve the shape.

Fig. 6.

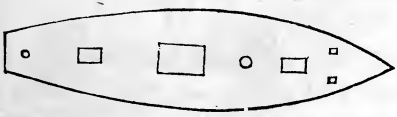
The Hold, or Inside (fig. 7). Scoop out with a gouge very gradually, first cleaning the sides all round, and then you can hollow out the rougher portions more freely.

Fig. 7.



The Deck (fig. 8) must be cut out of a thin piece of wood to the exact size of your yacht, having previously left a small ledge, as the dotted line in fig. 7, for it to rest upon. Having fitted your deck as neatly as possible, before securing it cut out the holes for the fore and aft-hatchway, companion, rudder, mast, and bitts for the windlass. Fix in firmly, but without glue ; painters' putty is the best to fill up any imperfection.

Fig. 8.



Main-hatchway (fig. 9), *Fore-hatchway* (fig. 10),

Companion or Binnacle (fig. 11). Cut out to form,

Fig. 9.

Fig. 10.

Fig. 11.

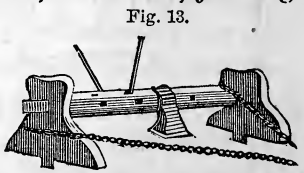
and insert the lesser ends of each into their respective holes.

Having now completed the hull of your vessel, take a piece of sand-paper and polish it carefully all over.

The Rudder and Tiller (fig. 12). Cut out to the proper shape and size, placing the small end through the hole in the stern; fix with a piece of strong thread or small string to the stern post of your yacht, about one-third from the keel; next insert the tiller into the upper end of the rudder.

Fig. 12.

Windlass and Bitts (fig. 13). Cut out, join together, and fix in the two holes in the fore part of fig. 8. Previous to proceeding with the masts and rigging you had better first paint the hull with a priming of lead color all over, outside and in; when dry, paint the inside of the bulwarks, deck and hatchways a light stone color; the bottom, to about half way up the sides, copper color (mix a little of this with the deck color); and paint the companion and windlass, and the upper sides of the vessel, all black.

Fig. 13. 

Figs. 14 and 15 are two stands cut out of pieces of wood to the shape of the bottom of your yacht; fix them about one-third from each end for it to rest upon.

Fig. 14.

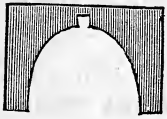
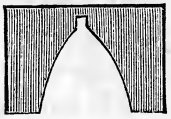


Fig. 15.



The Masts.

For the *Main-mast* (fig. 16) get a straight piece of wood the length of the deck of your yacht, round it carefully, taking care to leave the projecting portions at the top of the trunk. These are called the tressel-trees. The upper portion or trunk is nearly square, with the edges just turned; a smaller square is left on the top of all, on which is afterwards fixed the cap. The lower end must be fined to a point to fix in the bottom of the vessel.

Fig. 16.

The Cap (fig. 17), in small vessels, is generally made of iron, but in larger ones of wood bound with iron. To make it, get a small piece of tough wood, cut out a round and a small hole nearly close together, and cut to shape.

Fig. 17.

The Cross-trees (fig. 18), are formed also of tough thin pieces of wood about the length of the breadth of the deck. Large yachts

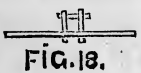


FIG. 18.

sometimes have two, but mostly only one ; they are secured to the top of the tressel-trees and are a support to the

Top-mast (fig. 19). This is about two-thirds the length of the main-mast, and thinner in proportion, gradually tapering towards the top, on which is fixed a small round cap ; there is a small square portion at the bottom through which passes a small pin or fid resting upon the tressel-trees ; the top of all is called the trunk.

Fig. 19.

The Bowsprit (fig. 20) is also quite round, except the part which goes inside, which should be square, and not quite so thick as the main-mast ; at the inner end is a small hole, through which passes a pin to fix it to the bitts ; altogether it should be about two-thirds the length of the vessel.

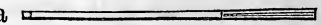


Fig. 20.

Main-boom (fig. 21). This also should be about the length of the bowsprit, but much thinner ; the inner portion is a half circle which works round the main-mast ; at the outer ends are two blocks, one above and one below.

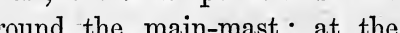


Fig. 21.

Gaff (fig. 22). The same shape, only smaller and thinner in proportion, three

Fig. 22.

small blocks are fixed on the upper part, and one below at the end.

The Yard (fig. 23) is a long thin spar, nearly the length of the main-mast, but not thicker than the top-mast; there is one block in the upper centre, and two below directly under the one above, and two small holes at each end passing downwards.

Fig. 23.

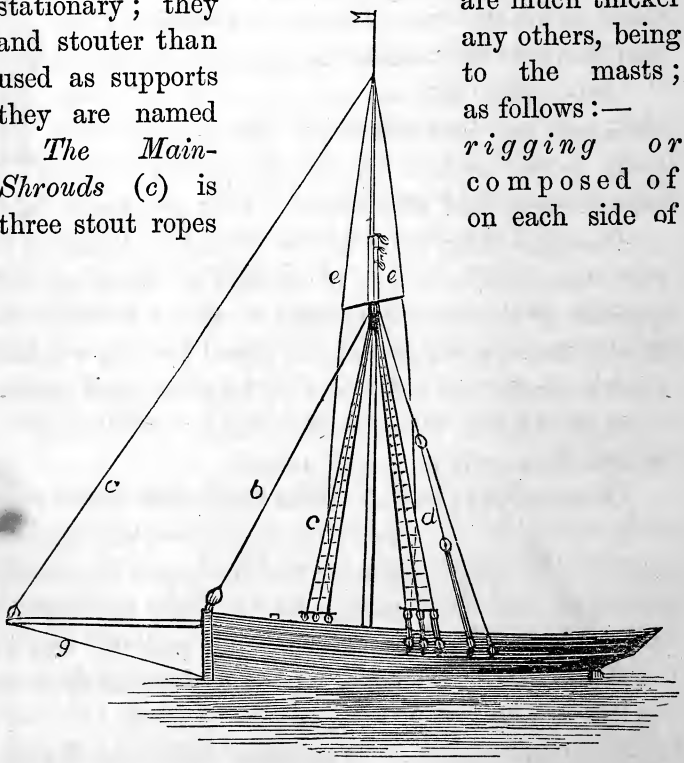
To paint the Mast and Spars.—The main-mast from the bottom of the tressel-trees must be white upwards, also the bottom part of the top-mast-cap and cross-trees, the trunk of the top-mast, all the main-boom and gaff, a very small portion of the extreme end of the bowsprit, and all of it that is inside the yacht.

To fix Mast and Rigging.—Having previously made a small hole in the bottom of the hull, corresponding with the one on deck, insert the lower end of the main-mast and fix it firmly, with a slight inclination backwards, and having made a hole in the front of the bulwarks close to the stem, place in the bowsprit from the inside. In large vessels an iron ring is attached to the stem, through which it also passes on the outside.

Standing Rigging (fig. 24).

These ropes are so called from being generally stationary; they are much thicker and stouter than any others, being used as supports to the masts; they are named as follows:—

The Main-Shrouds (*c*) is *rigging* or three stout ropes composed of on each side of



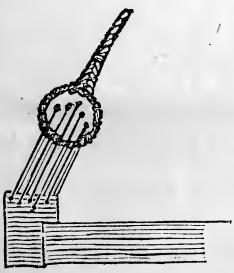
Standing Rigging.

the mast, passing over the tressel-trees and down

to the sides of the vessel. In large yachts, they pass round large blocks, called "dead eyes;" these again are tightened by smaller ropes passing through another set of dead-eyes attached by iron hoops to the sides of the yacht.

Back-stays (*d*) are two ropes of the same thickness, and pass round the front of the main-mast to the back of the upper portion of the tressel-trees, half way down. They are made of the same thick rope as the shrouds. One end of the other smaller ropes is hooked to rings on each quarter of the vessel, passing upwards through the blocks above, down again, and round two other double blocks, which are tightened by smaller ropes passing through them to corresponding blocks a little in front of the other ends on each quarter.

Fore-stay (*b*).—This is also made of the same stout cord; the upper end passing over the back of the top of the tressel-trees, and the lower end round a large dead-eye, and by smaller ropes attached to the stem of the cutter.



Top-mast Rigging.—Having fixed the cap on the square of

the trunk of the main-mast, insert the narrow end of the top-mast first through the tressel-trees and then through the cap, and fix it by placing a small pin through the bottom of the top-mast.

Top-mast stays (*e e*) secured to the trunk of the top-mast; they come down on each side, and over the ends of the cross-trees, to the dead-eyes on each side of the yacht.

Fore-top-mast stay (*a*).—This is also secured to the trunk, and passes through a block at the end of the bowsprit to the deck.

The Bob-stay (*g*) is a support to the bowsprit, being fixed to the end, coming down to a cleet on one side of the stem, and secured on deck.

Vane (*f*), fixed on the very top of the mast; it moves round on a spindle, and points to the direction from which the wind blows.

Running Rigging (fig. 25).

The name given to ropes or halliards, for hoisting up and down the sails, &c.; they are generally smaller than the standing rigging, and pass through blocks from two to four times each.

Main-boom (*e*).—This is attached to the main-mast by a small rope passing through each end of the half

circle. The outer portion is supported by a rope passing from a block at the top of the mainmast trunk, down through another block at the end of the boom, and through the upper one again down to the deck; it is kept in its place by the mainsheet (*n*), a rope passing through double

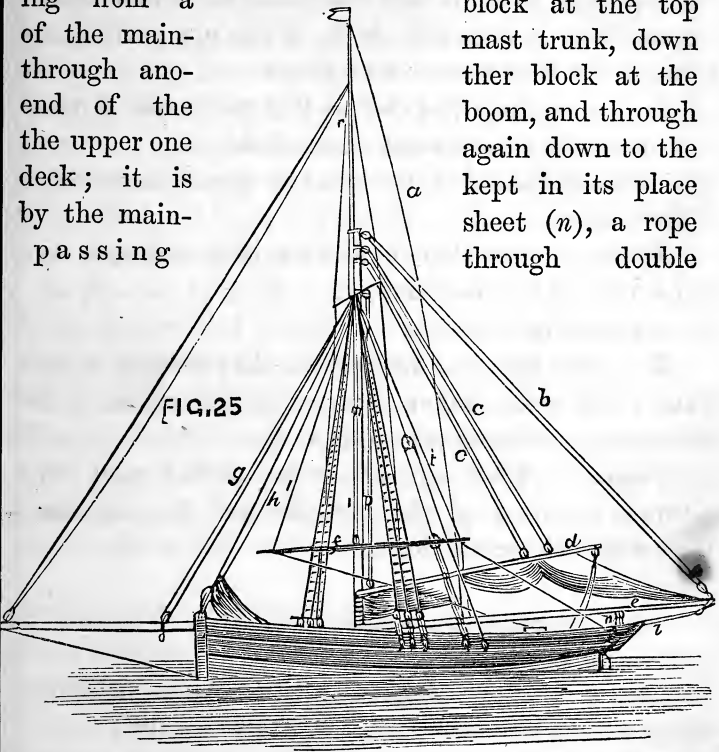


FIG. 25

RUNNING RIGGING.

blocks—one being attached to the boom, and the other to an iron traveller on deck.

The Gaff (*d*) is also secured to the mast in the

same manner; but as it is required to hoist the main-sail up and down, it is furnished with a double block near where it joins the mast on the upper side, and two single blocks—one near the centre, and the other between that and the end of the yard; also a small block at the extreme end downwards.

The Main-sail Halliards (*p*) pass from a double block at the bottom of the trunk of the main-mast through another double block in the gaff, and from the upper again to the deck.

Peak Halliards (*c c*).—These hoist up the outer end of the gaff and main-sail: they first pass from the third block below the top of the trunk of the main-mast, coming through the inner block on the gaff, up again and through the same block above, down through the outer block on the gaff and up again through the second block on the trunk of the main-mast.

Jib Halliards (*g*).—A block with a hook is attached to a ring in the upper corner of the jib, through which passes a rope travelling from a block just in front of the cross-trees, and through these to the deck.

Fore-sail Halliards (*h*), are secured to the fore-sail in the same manner as the jib, and also hoisted by two blocks; the upper one attached just below the cross-trees.

Jib Top-sail Halliards (*q*). A single rope passes from the upper corner of the sail through a small block in the front of the trunk of the top-mast down to the deck.

Gaff Top-sail Halliards (*r*) pass through a block in the top of the mast, and down to the deck.

Half Top-sail Halliards (*s*) also pass through a hole in the top-mast, or through a small block there, and down to the deck.

Square-sail Hallyards (*t*) are three in number; one passes from the centre of the sail up through a block under the front of the cross-trees and down to the deck; two others are hooked to each of the upper corners of the square-sail, passing through holes in each end of the yard; they travel through blocks secured to the upper main-rigging just below the cross-trees.

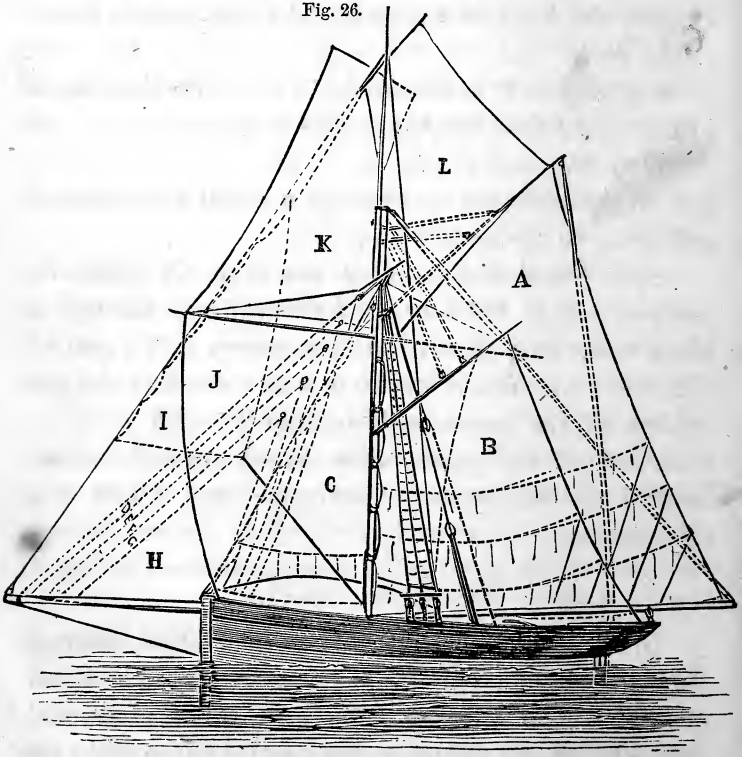
The Sails (fig. 26).

In all ships the sails are made of stout canvas, sewn together in long strips; a rope is likewise sewn all round the outer-side, to give them additional strength. For your little yacht white calico will best answer your purpose.

The Main-sail (A) is the largest; the upper portion is laced through a series of small holes to the

gaff: being securely fastened at each end, it is attached to the mast by hoops which travel up and down.

Fig. 26.



The Sails.

The Storm Mainsail (B) is made in the same way, only smaller altogether.

The Fore-sail (C), like the main-sail is attached to hoops which travel up and down the fore-stay, and is hoisted up by blocks placed under the cross-trees.

The Jib (D) is a sail on the bowsprit; the lower end is hooked to a ring called a traveller, and hoisted up by blocks at the upper corner to others above the cross-trees.

Storm Jibs (E, F, G and H) are made the same as the jib, but smaller in proportion.

Jib Top-sail (I); same shape as jib, but also smaller; it is laced to the fore-stay, and hoisted up to the top-mast head, the front corner being secured by a rope, passing through a small block at the end of the bowsprit, and from there to the deck.

Square-sail (J), hoisted up by a block in the centre, passing through or under the cross-trees, and down to the deck, and one at each of the upper corners, through the ends of the yard, to the main-mast head, and down to the deck.

Half Top-sail (K), hoisted up to the top-mast head, the outer lower corner passing through a hole at the end of the yard, and again through another block under the centre of the yard, and down to the deck; the inner lower corner of this sail is also brought down on deck.

Gaff Top-sail (L), also hoisted up to top-mast

head, the outer corner passing through a block or hole at the extreme end of the gaff, passing under it to another block near the mast, and down to the deck; the inner lower corner also passes straight down by the mast.

Reefs.—A series of short cords for the purpose of tying in a portion of the sails; there are generally three rows in the main-sail and one in the fore-sail of yachts; none of the other sails have any.

Reef-tackle.—These are to fasten the ends of the respective reefs to the main-boom.

Sheets.—Used to haul in the sail, and make it stand to the wind.

Main-sheet is reefed through double blocks; one is attached to the main-boom, and the other to a "horse," or iron rod on deck.

Fore-sheet.—This also travels on an iron rod to either side of the vessel.

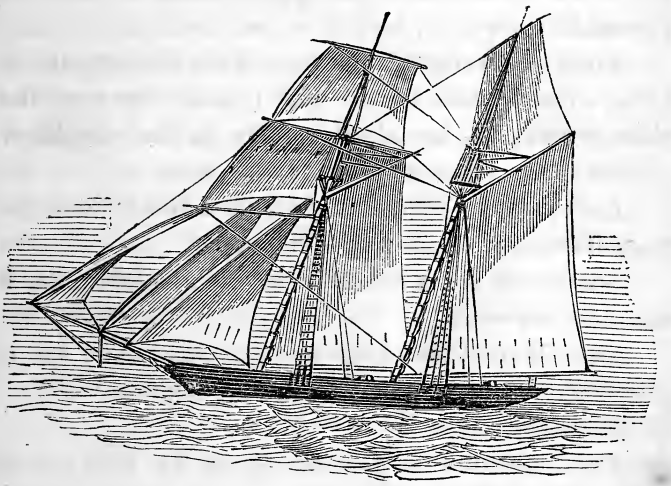
Jib-sheets.—This sail has two—one on each side.

Gaff Top-sail-sheet is reeved through a sheave at extreme end of the boom.

Half Top-sail-sheet passes through a block at the end of the main-yard; through another below the centre of the yard, and down to the deck.

Jib Topsail-sheets.—This sail like the jib has two sheets—one on the port, and one on the starboard side.

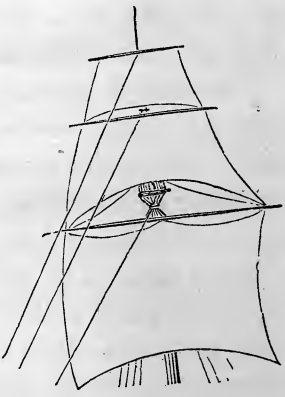
SCHOONER.



Next to the cutter the schooner is the favourite rig for yachtmen ; but it is more adapted for vessels of larger size. The schooner has two masts, and they are in two parts each, the same as the cutter. The lower portion is called the fore-mast, and the after one the main-mast ; the upper portions are called the fore-top-mast, and the main-top-mast ; they are joined together as in the cutter, through a cap, and the

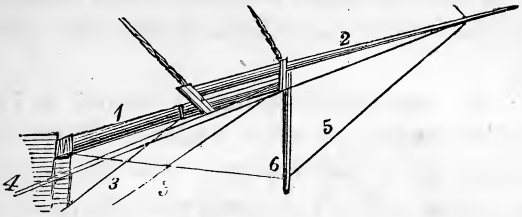
bottom of the top-masts secured to the tressel-trees, the main-mast being a little longer than the fore-mast.

The main-mast is rigged similar to the one mast in a yacht, having a main-sail and booms, and over all a gaff top-sail. On the foremast it has a fore and aft fore-sail; in the front of the fore-mast it has three square yards: the lower one called the main-yard, the one above it is the top-sail-yard, and the upper one of all is the top-gallant-yard. The sails belonging to these are laced on the main and main-top gallant yards, the square-sail being only used in going before the wind, and it is hoisted up to the yard from the deck. When the square-sail is not set, and the vessel sailing with a side-wind, the fore-stay-sail and jib are set, as shewn in the engraving.



Another distinctive feature between the cutter and the schooner is the bowsprit, where instead of being in one piece as in the former, it is in two; the part attached to

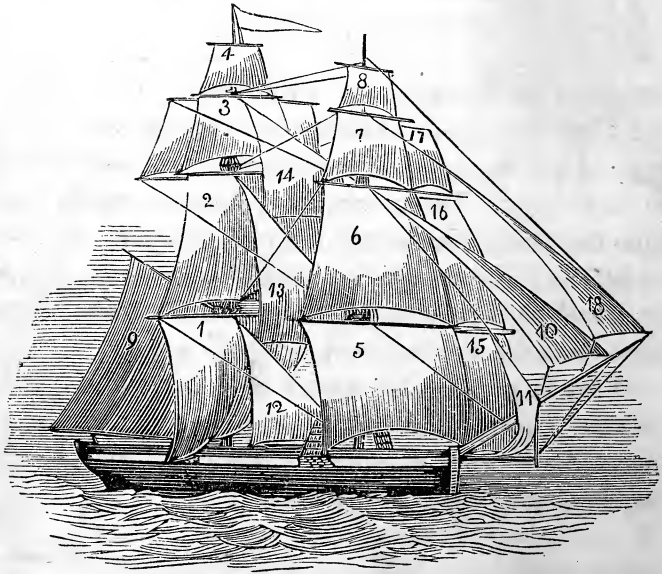
the bow is called the bowsprit (1); there are two caps



fixed on this, through which the outer portion, called the jib-boom (2), is hauled out. Two bob-stays (3) support the bowsprit to the cut-water, as well as two or more ropes, called guys or shrouds, which lead from the end of the bowsprit to the sides of the vessel (4), the jib-boom being in like manner supported by guys (5), with the addition of one through the dolphin-sticker (6), to the bow of the schooner.

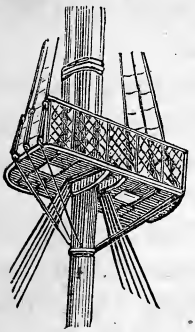
Vessels of this description are sometimes rigged without yards, occasionally using one large square-sail. The masts generally rake a little, and they sail very fast, particularly on a wind.

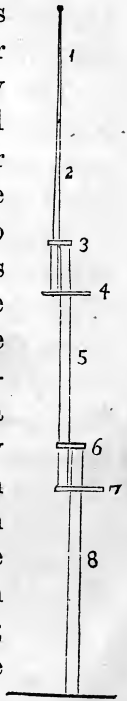
BRIG.



Brigs and ships are distinguished as square-rigged vessels—the principal sails being set across the masts instead of fore and aft. Like the schooner, they have two masts; the difference being that each mast has three distinct parts in the place of two, the lower por-

tions being called the fore-mast, and the after one the main-mast. The various parts are joined together similar to those already described in cutters and schooners, only the lower masts have, in the place of two cross-trees, two round tops; they serve as greater supports to the main-top-mast, &c. Above the main-top-mast is the main-top-gallant-mast, and this is fixed to the former by a cap and cross-trees similar to those already described for a cutter:—1, trunk, on which the royal is set; 2, top-gallant-mast, on which the top-gallant-sail is set; 3, the cap; 4, cross-trees; 5, top-mast, on which the top-sail is set; 6, cap; 7, round top; 8, main-mast. Both masts are alike, the after or main-mast being a little the longer.





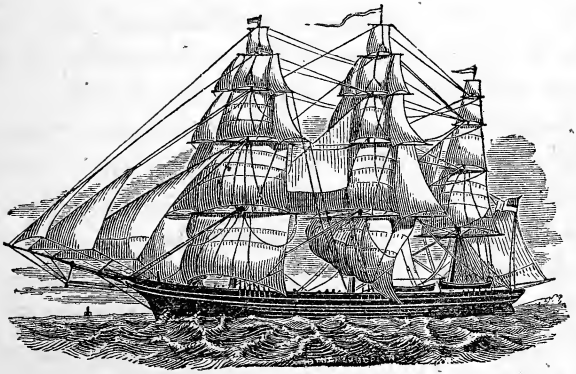
The sails of a brig are—1, the main-sail; 2, main-top-sail; 3, main-top-gallant-sail; 4, main-royal; 5, fore-sail; 6, fore-top-sail; 7, fore-top-gallant sail; 8, fore-royal; 9, the spanker; 10, the jib; 11, fore-top-mast stay-sail; 12, main-stay-sail; 13, main-

top-mast stay-sail; 14, main-top-gallant stay-sail; 15, fore-studding-sail, 16; fore-top-mast studding-sail; 17, fore-top-gallant studding-sail.

The same are used on the main-yard, and are called the main-top-gallant studding-sail, &c.; these sails, however, are only used occasionally, in light winds and fair, as well as the flying-jib, 18.

Brigs are much used in the merchant service, and in the coasting trade. Several thousands of this class of vessels are used in the coal trade alone. The celebrated Captain Cook first went to sea in a small brig, which, until lately, might be seen as a river police station, moored in the Thames near Somerset House. Robinson Crusoe, our young readers may remember, also first sailed in a brig.

CLIPPER SHIP.



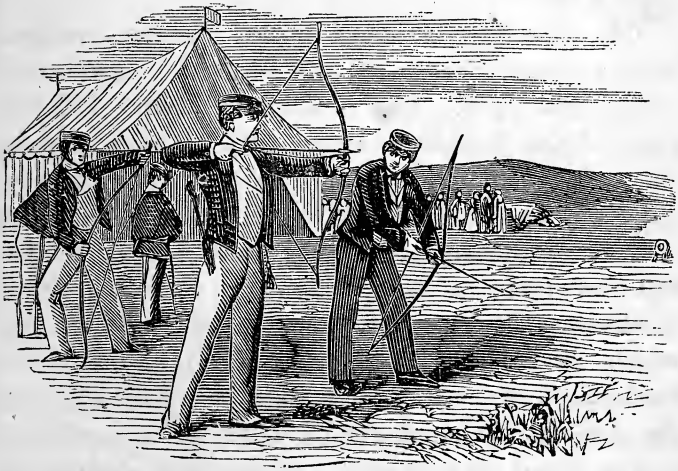
THIS is the manner in which all the largest ships are rigged; formerly it was the custom to have very square-built vessels with very long masts; but in the modern clipper ships they are much shorter in proportion to the extra length and sharpness of the vessel; they also rake a little more. A ship has three masts, and all square-rigged. The description already given of a brig will answer for a ship, the two first masts being the same as well as the sails and their respective names; the third mast is the same, but much shorter —it is called the mizen-mast, mizen-top-mast, mizen-

top-gallant-mast, and mizen-royal. The sails are the mizen-top-sail, mizen-top-gallant-sail, mizen-royal, and spanker.

A BARK

Is also a three-masted vessel; but the difference from a ship is in the rigging of the mizen-mast, which instead of having square yards on all the three masts alike, the after one is rigged exactly like a sloop, being in two pieces, with cross-trees, and carrying a gaff top-sail; they are preferred in the merchant service as they do not require so many hands to work them.

ARCHERY.



One of the most ancient and universal of all weapons is the bow; it is frequently alluded to in Holy Writ, and it is very remarkable that the shape of the modern bow is very nearly the same as we find it represented upon the early Egyptian sculptures. That of the Greeks and Romans was also similar in shape, but a little more orna-

mented. The early Saxon specimens and those of nearly every other nation appear to have been of the same form.

By this simple but powerful weapon empires were anciently subverted, and England gained much of her fame by it. In the time of Edward III. the glory of the long-bow may be said to have been at its zenith, and that monarch appears to have been very anxious that its lustre should remain untarnished. It was during this king's reign the famous battles of Cressy and Poictiers were fought; the former on the 26th of August, 1346, and the latter on the 19th of September, 1356. Another signal victory, ascribed to the skill of the English archers, was at the battle of Agincourt; this was under Henry V. in the year 1415.

It is said that James I. of Scotland, during his confinement in England, was so struck with the spirit and gallantry of the English archers, that on returning to his own country, he established the Royal Company of Edinburgh Bowmen. The society still exists, and is the Queen's Body Guard in Scotland at the present time.

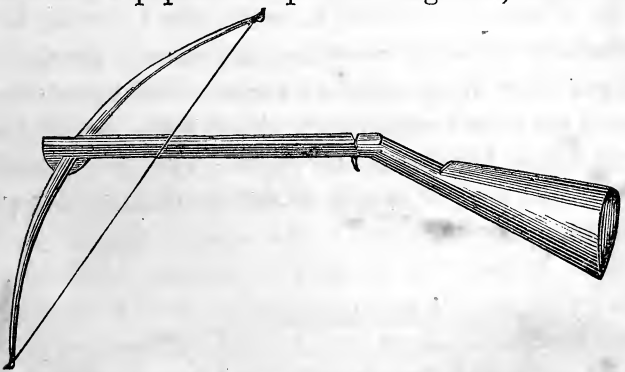
The Honourable Artillery Company of London owes its origin to a society of archers in the time and under the patronage of Henry VIII. They first held their meetings at Spitalfields; but when the "fields"

were broken up for bricks and buildings, the Artillery Company removed to Bunhill Fields, which they still retain under the original title of the New Artillery Ground.

In 1682, there was a great cavalcade and grand entertainment given by the archers of Finsbury. Charles II. was present on the occasion, but the day being rainy he was soon obliged to leave the field. So late as 1753 targets were erected in Finsbury Fields during the Easter and Whitsun holidays, when the best shooter was styled captain for the ensuing year, and the second, lieutenant.

The Cross-Bow

Was also a popular weapon in England; the arrows



shot from it were called *quarrels or bar-bolts*, which

is synonymous with the arrow of the long-bow; it was fastened to the stock and discharged by means of a catch, or trigger, which most probably gave the notion of the lock of the modern musket. It is said they were used at the battle of Hastings, and Harold's death was caused by one of them. After the introduction of gunpowder the science of archery declined as a military art, but from the glory and renown which Englishman achieved by the use of the bow and arrow it is to this day practised in England, principally as a healthful and elegant accomplishment.

How to make Bows and Arrows. The most easy method is to take a common cane, cut a small notch near each end, and tie a piece of small cord or twine thereto, giving it a slight curve, (fig 1). The best bows are made of yew-tree, laburnum, acacia, or thorn. The wood ought to be free from knots; two pieces are joined together, the back being of different wood to the front, and the grain reversed. The flat or outward part of a bow is called its back, and the inward part the belly; the proper length for a youth should be from four-and-a-half to five feet;

Fig. 1.

Fig. 2.

the most finished have their ends tipped with horn (fig. 2).

Arrows are generally made of white light wood, such as pine, ash, &c.; the most finished are varnished. The length of the arrow must be in proportion to the size of the bow; the nicks of the best are cased with horn, and should fit the string exactly. The principal thing to be attended to is that they are perfectly straight, and the feathers can be tied with a piece of strong thread, the lower portion being about half an inch from the end; a grey goose feather is the best of all for the purpose.

Fig. 3.

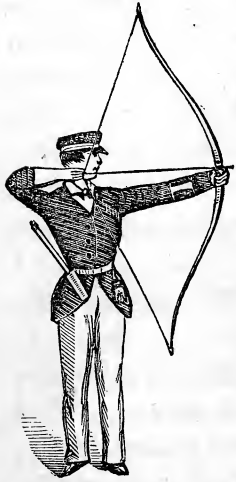
It is not necessary for the young archer to have all the equipments of a complete bowman; our object being to give such directions as will enable him to make a bow and arrow, and use them properly. Having made these, he must have an object to shoot at, and that is generally a target (fig. 4). They are made of plaited straw bands wound round a centre and sewn together; over this is placed paper or canvas, and painted white; a series of four circles is then painted upon it at equal

Fig. 4.

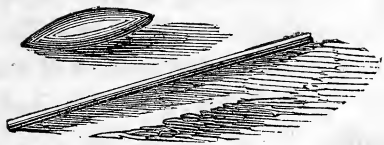
distances, the inner one is called the bull's-eye, and the great object is to hit this if possible.

Position in shooting (fig. 5). The archer taking his stand before the target, his face being a little inclined to the right turning slightly round so that his eye and the target are in a direct line; the body perfectly upright, with the left foot slightly in advance, and holding the bow horizontally in the left hand, the fore-finger holding the arrow secure on the wooden part of the bow, in the centre—the right hand fixing the nick of the arrow on the string where it is held fast between the first and second finger, the fore-finger on the left hand is next removed from the arrow, the centre of the bow grasped tightly, gradually raise the bow with the left hand, at the same time pulling the string by the right, and when the arrow is drawn about two-thirds of its length, the nick of it should be brought close to the right ear and the aim taken; this must be done quickly, and it can only be done well by practice.

Fig. 5.



TIP CAT.



This is a common sport among boys, more particularly in the country; it has a great advantage in being easily made with a common knife. The piece of wood which is called the "cat" is about six inches in length and from one-and-a-half to two inches in diameter, gradually tapering from the middle to each end.

The cudgel with which the game is played is about the length and thickness of a common hoop-stick. The player taking this in his right hand strikes one end of the cat smartly, which causes it to rise in the air, high enough to be struck before it again falls to the ground.

There are several ways of playing the game of cat. The most common is to make a ring, selecting a piece of flat ground; one boy holds a piece of string that will make the circle required at the centre, and another boy taking the extremity of the string, and with a piece of chalk he walks round and forms the ring: the

player takes his stand in the middle, and his business is to strike the cat outside the ring; should he fail in doing so he is out, and the next player takes his place. If successful he judges with his eye the distance the cat is driven from the centre of the ring, and calls for a number to be scored to his side, if the number named be found to exceed the same number of lengths of the stick he is out; if on the contrary, it does not, he obtains his call.

Another game is to make six or eight holes in a circular direction, and at equal distances from each other; at every hole the players take their stations, with their sticks; one on the other side, tosses the cat to the nearest bat-man, and every time the bat is struck the players must change their positions, and run once from one hole to another. If the cat is sent a great distance, they continue to run in the same order claiming a score towards their game every time they change from one hole to another. If the cat is stopped and thrown between any two of the players, and it crosses him after he has left one hole and before he reaches the next he is out.

POP-GUN.

SELECT a straight piece of an old branch of the elder-tree ; cut it about six or eight inches long. The pith in the inside is then forced out with an iron ram-rod, or one made of hard wood turned or cut to this shape.

The Pellets are made with moistened tow or brown paper ; when the pellet is prepared it should be laid over the mouth of the gun in sufficient quantity to require squeezing or plugging in. The first pellet must be driven through the gun to its other end, and the second again driven in a similar manner. When forced through the gun, the air between the pellets being incompressible beyond a certain point, forces out the lower pellet with a loud pop, from which the name of pop-gun is taken.

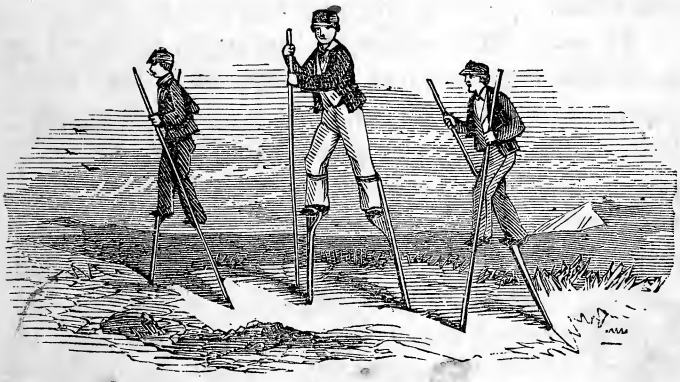
SLING.

THIS, which is a mere toy in modern days, was in ancient times a formidable weapon of war; and as late as the battle of Hastings, was used in the English army. It is extremely simple in its construction, and even now, by dexterous and expert throwing, its results are astonishing.

It is made of a leathern thong, broadest in the middle, and tapering off gradually towards the ends, sometimes a small hole is cut in the centre to fix the stone upon. A piece of strong string, or small cord, is fastened through a hole at each end, one of which has a loop at the end, which is put on to the middle finger of the right hand, and the extremity of the other string is held between

the fore-finger and thumb ; it is then whirled round and round until it has gained sufficient impetus, and suddenly letting go the string held between the finger and thumb, the stone is shot forth with great velocity.

STILTS.



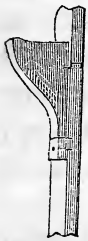
This is a favourite out-door amusement among boys at the present time. To a casual observer it appears rather a dangerous sort of sport, but it is not so ; with a little practice it is extremely easy. Many of the shepherds in the desert of Landes, in the south of France, use them with perfect freedom and great rapidity; constant habit enables them to preserve their

balance so well that they run, jump, stoop, and dance with the greatest ease and security. They are by their stilts enabled to see their flocks at a much greater distance, over a perfectly flat country, their feet being perfectly protected from the water during the winter, and the heated sand in summer. In addition to the stilts, they use a long staff, which they carry in their hands; this guards them against an accidental trip, and forms a third leg when they require to rest.

To make stilts.—Procure two poles, about six or seven feet long, and nail on a strap of leather, about one-third from the bottom of each; into these the feet are placed, the poles being kept in a proper position by the hands, and moved forward by the action of the legs. A wooden step, however, is better, and it gives greater firmness to the tread; it is nailed or screwed to the poles. But the best of all are those that do not reach the hands, but are secured to the leg just below the knee by a strap, the foot-step being the same as fig. 2. With the addition of a long staff any boy could soon manage to walk in safety upon them.

Fig. 1.

Fig. 2.



ANGLING.

Rods, Lines, Floats, Hooks, and Baits.

There is no recreation more agreeable and delightful than angling. It is as much enjoyed by the chubby rustic child, with his pin hook and rod of hazel, in the quiet shady pool, as it is by the wealthy of the land in their most favourite preserves. There is a healthful exercise in its pursuit both for body and mind; and the impressions left on the memories of those who have "paidled in the burn," and fished in cool streams and meandering rills in their early days, must always be remembered with feelings of extreme gratification. Angling is almost an instinct with most boys, particularly those brought up in the country, and as every boy may be an angler if he pleases, it will be useful for him to know how he may make his own fishing tackle.

Rods.—These are made to great perfection, and may be had of every variety from the professional makers, but as they are generally expensive for a boy, with a

little trouble and skill, he will be able to make one that will answer his purpose as well as the most costly. For the very young angler, a hazel stick will make a good rod for fishing for small fish, such as sticklebacks, minnows, &c. Having selected as straight a one as possible, a common knife is all that is required to polish it into shape.

The next best rod that a boy may make for himself is formed of two pieces—the bottom of ash, and the top of lance-wood ; these, if properly tapered, and not too heavy, will be found to have an equal and regular spring ; and the two pieces can be firmly bound together, by splicing the two ends and binding them together tightly with waxed silk or small string.

The best rods, however, are made of bamboo cane with tops of various lengths : twelve feet will be found a convenient length, but they are sometimes made to fourteen and even sixteen feet long. The great point is to have a rod as free as possible from imperfections, and tapering gradually from the but-end to the top. They may be fitted as walking-sticks, or made to pack in canvass bags.

Lines are sometimes made of twisted silk, or silk and hair. Horse-hair is the best material; those made of silk and hair retain the water. Brown, grey, and white are the best colours. Three yards will be found the most useful length for a young angler.

In fly-fishing, the bottom or casting line which is fixed to the line upon the reel, should be nearly the length of the rod; it should be made of gut, fine at the bottom or "dropper," and strong at the top. The length of the line required to throw, varies of course with the river, and the spot you wish to throw to, but about twice the length of the rod will generally be found sufficient.

Floats.—For small fish and slow waters quill floats are the best; they are made of various sizes, the ends being painted blue or red.

Plugged Floats are made with a goose-quill, and a wooden plug at the bottom.

Tip-capped Float is one of the best that can be used; it is made of quills or reeds for the middle, and

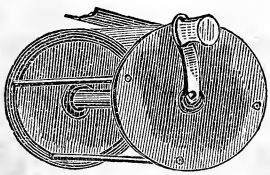
ivory or tortoise-shell for the top and bottom—narrow at the ends, and gradually increasing in circumference to the middle.

Cork Float.—Take a sound cork, and bore it through the middle with a red-hot iron, put in a quill

to fit it, and cut it to the shape of a pear; grind it smooth with pumice-stone, and paint or colour it in whatever way you please.

Shotting the Line.—These are to make the float partially sink in the water; place them all together, within three inches of the bottom of the loop of the line, fix the loop of the hair to which the hook is tied, and place two very small shots, about two inches from the hook, which will cause the bait to swim steadily, and the others above the first loop.

Reel.—This is a necessary addition, to large rods particularly; it enables you to play your fish with more ease and certainty, and to reach places which, without its assistance, you could not attempt. They may be had of various constructions at the tackle-shops.



Hooks.—There are four kinds of hooks:—the Sneckbend, the Limerick, the Kendal, and the Kirby. There is a great variety of opinion as to the relative merits of each among the best anglers, some preferring one to the exclusion of the others. The Kirby, however, is one that we can recommend; its shape is well adapted for hooking and holding the fish. The

hooks are numbered from the largest (No. 1) to the smallest (13), according to size. The hooks most suitable for the following fish are—

Minnow	13	Flounders	6
Shiner	13	Perch	4
Sunfish	13	Eels	4
Loach	13	Carp	3
Gudgeon	12	Trout	3
Roach	10	Blackfish	4

In tying on hooks, you must use strong but fine silk ; it must be as near the colour of your bait as possible. Wax the silk well with shoemaker's wax, and then wrap it three or four times round the body of the hook—the gut or hair being on the inside of the hook—and then wrap the silk tightly round it, about three parts down the hook.

Plumbing the Depth.—Much of the success of the angler in bottom-fishing, depends upon his knowing the proper depth. This is done by a plummet ; they are of two kinds. The folding plummet will be found the most convenient ; it is made of a slip of sheet-lead folded up. To fix it on the line, unfold it about two inches, pass the hook over the side, and then fold the plummet up again. When the plumb-lead touches the bottom, and the top of the float is even with the surface of the water, you will have the correct depth.

Baits.—Worms are the most natural baits, and nearly every fish will take them. If the river is at all muddy it is the best bait that can be used. The principal are—

Lob-worm.	Flag-worms.
Brandling.	Grasshoppers.
Meadow-worm.	Wasp-grub.
Tag-tail.	Beetles.
Ash-grub.	Paste Baits.
Cow-dung Bait.	Salmon Spawn.
Caterpillar.	White Bread-paste.
Cabbage-worms.	Cheese-paste.
Maggots.	Wheat-paste.
Cad Bait.	Ground Bait.

During spring and autumn these may be used any time of the day, but in the summer only early in the morning or late in the evening.

To scour and preserve Worms.—Procure a quantity of fresh moss, wash out all the earth, and squeeze it, but not too dry; press it tightly down in a jar, and throw the worms upon it. Gentils should be thrown into a mixture of damp sand and bran, to clean them; and they will be ready for use in two days.

FLY-FISHING.

To be an expert fly-fisher is generally the ambition of the most enthusiastic angler ; it requires much more neatness and skill than for bottom-fishing, and it is assuredly more gratifying in its results. The learner, if possible, should go out with some experienced angler, watch his movements closely, and imitate them as well as he can. He should begin with the line only, not putting on any flies, trying a short line first, and lengthening it gradually ; the rod should be carried gently back, without effort, and thrown forward again when the line has reached its full extent behind him ; great care must be taken in doing this or the fly will be whipped off when he comes to use one. After attaining tolerable proficiency in this, the learner may then put on one fly, and fish for a while with that, adopting two or three when he is able to use them properly. The great art is to drop the fly lightly, that it may resemble a natural fly settling upon the water. Suffer the line to float gently down the stream, at the same time dragging it towards you to your left hand.

The best time for angling with the fly, is when there is a gentle breeze upon the water ; south and

west winds are to be preferred. The best time of day is morning or evening. You must be careful not to go near the bank, for fish are very quick of sight. If you see a rise, throw your fly about half a yard above, and let it fall with the stream, watching it narrowly, and strike the moment the fish rises ; when you have hooked one, play him carefully, keeping up his head and running him down the stream, at the same time drawing him towards you ; a smaller fly is required when the water is smooth.

The materials required to make Artificial Flies. —Feathers of the grouse, snipe, duck, bittern, golden plover, jay, starling, and peacock. Furs of all colours, from the skins of squirrels, moles and water-rats ; camel's hair, hare's ear, and fur from the neck of the marten ; mohairs of different shades, and camlets ; black horse-hair, hog's down, dyed various colours ; gold and silver twist, and sewing silk of all colours and thicknesses ; a pair of fine-pointed scissors, and small pliers.

Flies.

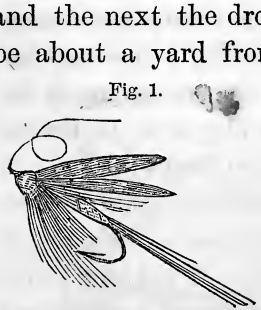
In making your fly, imitate as much as possible the natural fly you wish to represent. Having a hook

the right size, a feather of the proper colour, stripped down on each side, leaving just as much as will do for the wings at the fine end; a piece of fine gut, free from imperfections, and properly tested as to its strength; dubbing, or hackle, and a piece of fine silk, well waxed with shoemaker's wax; then, holding the hook in the left hand, wrap the silk round the bare hook two or three times, and put the finest end of the gut on the under side of the hook. If for a hackle-fly, begin at the bend and work up to the head; after turning three or four times round the hook and gut, fasten in the hackle and continue the winding of the silk until it reaches the end of the hook, then turn it back two or three times to form the head; the dubbing must now be twisted round the silk, and wrapped upon the hook for nearly half the proposed length of the body; fasten it there by a single loop, that both hands may be at liberty to manage the hackle; when sufficient feathers are wound upon the hook, the remainder should be held under the thumb of the left hand, and the entangled fibres picked out with a needle. The silk and dubbing must now be twisted over the end of the hackle until the body of the fly is of the length required. If gold or silver twist is used, the twist should be fastened to the lower end of the body before the dubbing is applied to the

silk. To make a winged fly the same plan is adopted in tying on the hook; then take the feather which is to form the wings and place it even on the upper side of the shank, with the roots pointing towards the bend of the hook: fasten the feather by winding the silk over it, and cut the loose ends close with a pair of scissors, divide the wings as equally as possible with a needle, passing the silk two or three times between them to make them stand in a proper position; carry the silk down the shank of the hook the proposed length of the body and fasten it, then apply the dubbing to the silk and twist it towards the wings; fasten in the hackle for the legs, and wind it neatly under the wings so as to hide the ends of the cut fibres; the silk must be fastened above the wings.

The fly at the end of the line is called a stretcher, and the next the dropper. The first dropper should be about a yard from the stretcher, and the second about three quarters of a yard from the first; made on pieces of gut four inches long, to detach at pleasure.

Fig. 1.

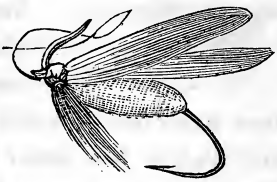


Green or May-fly (fig. 1).—The wings are made of the light feather of a grey drake, dyed yellow; the body of amber-coloured mohair, rib-

bed with green silk; the head of peacock's harl; and the tail of three long hairs from a sable muff. This is one of the most killing flies for trout; it generally rises about the end of May, and continues for about three weeks; it is found in great plenty in sandy, gravelly rivulets.

Great White Moth (fig. 2).—The wings are made of a feather from the wing of a white owl; the body of white cotton; and a white cock's hackle wrapped round the body. This is a night fly, and should be used in a dark, gloomy night.

Fig. 2.



Bee-fly (fig. 3).—This is an excellent chub-fly, and is in use during the summer months. The wings are made from the feathers of a blue pigeon's wing; the body of chenil of various colours, arranged in stripes in the following order:—black, white, light yellow, white, black and white; the legs of a black hackle; and the body dressed thick.

Fig. 3.

Fig. 4

Stone-fly (fig. 4).—The wings are made of a dusky

blue cock's hackle, or a mottled feather from a hen-pheasant; the body of dark brown, and yellow camlet, mixed; and a grizzled hackle for the legs; the wings must lie flat. It appears about the middle of April, and may be used at any time of the day.

Grey Drake (fig. 5).—The wings are made of a dark grey feather of the mallard; the body of white ostrich's harl, striped with dark silk; the head of peacock's harl; and the tail of three hairs from a sable muff. It appears about the same time as the green drake, or a little earlier. It kills best from three till dusk.

Fig. 5.

Red Palmer (fig. 6).—The body of this is made of dark red mohair, ribbed with gold twist, and wrapped with a red cock's hackle. Palmers are all good killing baits, and may be used all the fishing season.

Fig. 6.

We give these specimens for the young angler to practice upon. When he has accomplished the art of fly-making, he will prefer making them after his own fashion, and it is always best to make the fly you wish to imitate—one that you know frequents the locality

you propose fishing in. The following flies are also favourites with the best anglers :—

Black Gnat.
Hare's Ear.
Whirling Dun.
Cock Tail.
Peacock Palmer.
Black Silver Palmer.
Red Ant.
Governor.
Gold Spinner.
Oak Fly.
Yellow Sally.
March Brown.
Willow Fly.
Haze Fly.
Fern Fly.
Black Palmer.
Black Palmer ribbed with gold.
Orl Fly.
Blue Gnat.
Little Iron Blue.
Gravel or Spider Fly.
Granham or Green Tail.
Whirling Blue.

Scapp or Landing Net.—The ring of this can be

made of a common cane, to which is fastened a small net, with a long pole or straight piece of wood for the handle. A ring made of iron or stout wire is better, when it can be procured.

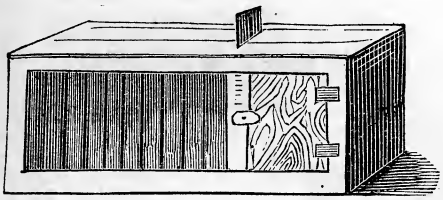
RABBIT HUTCHES.

RABBITS have always been great favourites with boys, and are not only a pleasant, but often may be made a profitable amusement. The domestic rabbits are of various colours. A variety of the hare-colour, that has much bone, long body, long ears, and large eyes, much resembling the hare, which they nearly equal in size, is in flesh considered superior to the common rabbit.

When choosing young ones to rear for does, take those that have the smallest litter. When six weeks old they may be removed from the doe, and placed in hutches two and two, until they are four months old, and after that time they must be kept separate. Does with long heads and ears are the best, and give the most milk. There are many varieties of fancy rabbits, but the lop-eared is the most popular; these also have many varieties, such as the up-eared, the forward or horn-lop, the oar-lop, and the real lop. Our young readers must please themselves as to the kind of rab-

bits they prefer to rear; our object is rather to instruct how to make houses for them, which are called

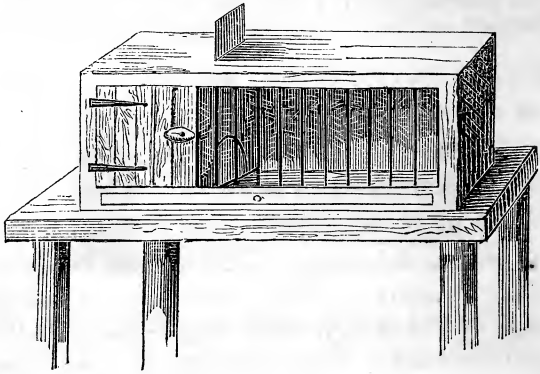
Hutches.—The most easily constructed can be made



out of an old tea or egg-chest; one-third being divided by a partition for a sleeping-place—a hole being cut in it sufficiently large for the rabbit to pass through. A sliding door must be made in the partition, to confine the rabbits during the time of cleaning. Stout wires must be driven into the top and bottom of the hutch for the front, about an inch apart, and the door put on with two leather hinges, and fastened with a latch or buckle.

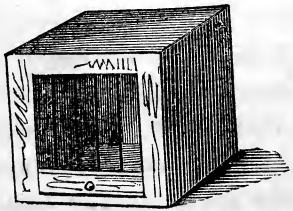
More finished hutches may be constructed for fancy rabbits on the same plan, with the addition of a drawer for the food; this should be tinned round the edges; also the circular hole in the partition, as well as every other part of the inside of the hutch, which the rabbits can bite with their teeth. The

bottom should be quite smooth, with a slip taken off



the lower part, and the hutch set a little backwards for the water to run off.

The Buck's Hutch is generally made of quite a different shape to that of the doe's or breeding hutches, but there does not appear any good reason for its being so. The form is something of the shape of a Dutch oven, with very little room for exercise. One made on the same plan as already described for does, with the wires a little stronger, should be more generally used, as the separate apartment



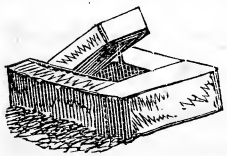
enables the rabbit to exercise himself when he pleases. The buck must always be kept in an apartment of his own.

Hutches may be set one upon another, or in rows, as most convenient; they should never be placed upon the ground, but elevated upon wooden stools or benches; and not put close to the wall, but sufficient room left for the dung to pass off from the apertures made in the back of the floor. They should be kept in a dry place, exposure to humidity being fatal to rabbits. Fresh air and thorough draught are necessary.

BIRD TRAPS.

Birds of all kinds are great favourites both with young and old. The splendour of their colours, the melody of their sweet voices, and the wonderful art with which they construct their nests, inspire a love and admiration to the great Creator of all. Without going into the natural history of the various singing-birds, we shall confine ourselves to the means of catching them. There are different modes; the most common for boys is the

Brick Trap.—It is made of four bricks—two being placed lengthways upon their narrow ends, and the third in like manner across one end; the fourth being placed between the two sides, so as to form a cover or lid. A forked twig is placed horizontally, and rests upon the edge of the front brick—the lid or top brick beng supported by a short piece of wood resting upon the narrow end of the fork. The weight of the bird alighting on the forked branch destroys the equilibrium, and the brick falls, and forms a close box in which the bird is a prisoner. A few bread crumbs or oats should be first put in as a bait at the bottom of the trap.



Sieve Trap.—This is another simple and readily-constructed trap. A large sieve is propped up at an angle with a stick, to which is attached a piece of string at the middle. Having strewn your bait under the sieve, take the end of the string, and conceal yourself behind a tree or wall, and when you observe the bird well under the sieve, quickly jerk the line, removing the stick, which causes the trap to fall over the bird.

The Springle.—This is an excellent trap, but more complicated to make. Take a hazel rod, four feet long, thick at one end, and tapering towards the other, and fix a piece of string, about fourteen inches in length, to the small end; it must be shaved off a little on one end to fit the notch in the spreader.

The Spreader is a small bent switch about a foot and a half in length; make a notch at the thickest end to receive the small one, and fasten it within an inch of the thicker end.

The Catch is a small piece of wood half an inch long, about half as broad, and a quarter as thick.

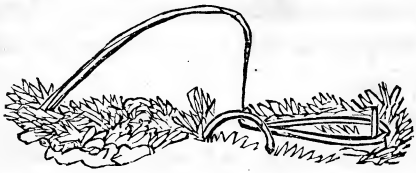
The Noose is a slip-knot of stout horse-hair, fastened to the end of the string below the catch.

The Stump is made of a short stake of wood a few inches in length fixed firmly into the ground; the head remaining about an inch above the surface.

The Bender is also a pliant switch of hazel, the ends of which are fixed in the ground, forming an arch.

To set the Springle.—The stump must be driven firmly into the ground, and the bow of the spreader over it, the bight being in contact with it. Fix the two ends of the bender securely into the ground, abont the length of the

former from the stump. The thick end of the springer is next fixed in the ground a short distance from the



bender, and the small end bent down till you can put one end of the catch upwards, and on the outside of the bender. The spreader being raised about an inch from the ground, and the smaller end of the catch being placed in the notch, to support it. The horse-hair slip-knot is next arranged around it, and the trap is complete.

A little seed is scattered inside and around the trap, and the bird being attracted to it perches upon the spreader, which falls with its weight, and the catch being set at liberty flies up, and the bird is caught in the noose ; care, however, must be taken to remain at a short distance to take your bird quickly, or in his efforts to escape he might be strangled, or flutter himself to death.

Liming a Twig.—One of the most simple modes of catching birds is with bird-lime ; it may be purchased in towns of the bird-fanciers, oilmen, or druggists. A branch of a tree is first taken and trimmed of the leaves, and then coated all over with the bird-lime ; a cage in which are your call-birds is then fixed

in a low hedge, and the smeared bough is placed over it. The wild birds being decoyed to the twigs, you conceal yourself somewhere near, and when the birds alight on the tree they stick fast, and you must lose no time in securing them.

The London bird-catchers use a large net—some as much as twelve yards long, and about two wide; they are spread upon the ground, and decoy-birds placed in small cages, at short distances from the net. The wild birds being attracted to the spot, the bird-catcher watches his opportunity, and closes them in by a sudden pull of the strings which he holds in his hands at some distance from the trap.

When birds are taken, they should be first placed in a dark place, or the cage covered over for a time, or they may seriously injure themselves by fluttering about in the cage. The best time for catching birds is early in the morning, soon after daylight; for after that time the birds are too busy looking after their food to be easily attracted by your decoys.

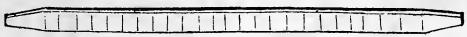
BATTLEDORE AND SHUTTLECOCK.

THIS is an old and favourite sport; it is also a very healthy pastime. In the time of James I., it was a fashionable game amongst grown-up persons. The Chinese play at it with their feet, hands, and elbows, and keep the cocks up in a most extraordinary manner. The practice of the game in this country is to keep the shuttlecock in the air by striking it from one person to another.

Battledores, as the name implies, were formerly all made of wood; they may be easily cut out of a piece

of flat board, not thicker than a quarter of an inch—the spades about five inches in length, and the same in breadth; the handles about six or seven inches long; and they will serve every purpose for young beginners to practise upon.

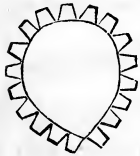
The best kind is made as follows: procure a slip of lance-wood, about sixteen inches long, an inch and a half broad, and a quarter of an inch thick, the edges of the outside slightly rounded; to make it bend to to the shape of the spade of the battledore, cut a slight nick, about an inch apart, all along the inside,

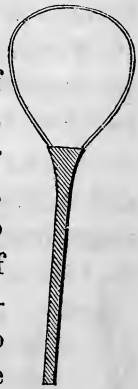


and not quite half way through the wood; boil or steam it with hot water, and it will curve to the shape, the two ends being beveled off to fit to the handle; this must be previously prepared quite round, except at the end to which the spade is attached, which must be quite square at the sides, and tapering a little at the extreme end. The spade end must then be glued to the two sides of the handle, and afterwards firmly bound round the join with fine waxed string; it must

then be allowed to dry; in the meantime prepare

your covering of parchment, cut round to the shape of the spade, with a margin large enough to turn over the wood-work. The ends to turn over nicely, must be cut out in this form ; the skin must then be soaked in water, the damp taken off, and the ends glued round the wood-work, and when dry you will have a superior battledore. The handle may be finished off by binding a strip of coloured leather or velvet all round it.

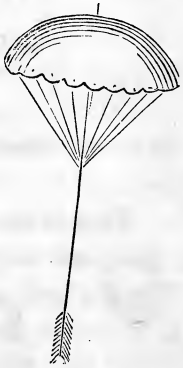




To make a Shuttlecock.—Cut a piece of sound cork to this shape, in it fix a short brass-headed nail at the lower end. Procure five grey goose feathers, about four and a half inches long, not too full, and all the same size ; fix the ends of these into the top of the cork in a circle—each one standing in an oblique direction to the other, and your shuttlecock with the battledore will be ready for play.

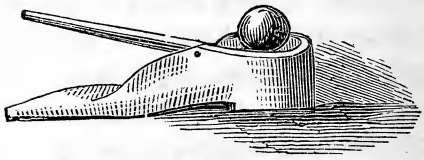
ARROW PARACHUTE.

THIS is an admirable contrivance to raise the parachute up in the air. We have already described the most common way of making them. There is, however, a difficulty at all times in getting them to ascend ; but by the means hereafter detailed, that obstacle is entirely removed.



To make one, you must procure a piece of thin, coloured paper, and cut out the form of the parachute (*see* page 12) ; then taking or making an arrow, rather long in the shaft (*see* page 93), cut out a small hole at the top of the paper, insert it over the end of the arrow, and fix it there with a little gum or paste, about an inch from the top ; attach pieces of thread to the extreme corners of the paper, and tie them together about half way up the shaft of the arrow, and when completed it will resemble a parasol or umbrella closed. When shot up with a common bow, it will ascend a great height, and in coming down again it will open out, and sail away to a great distance.

TRAP, BAT, AND BALL.



THIS is also an old English game. As early as the fourteenth century we have traces of its existence. The old method of playing was much the same as it is in the present time, only the trap was a little elevated, and not placed on the ground as it now is, commonly in the shape of a shoe. The trigger being struck at the extreme end forces upwards the spoon containing the ball, the motion describing a small arc or curved line; when free from the spoon the ball rises in a right line, and is projected forward in the same direction it was taking when set free.

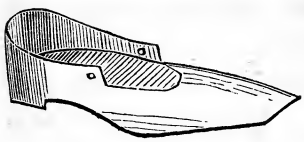
The game is played in various ways. The usual plan is to choose sides, tossing up for the innings, boundaries being placed at a given distance from the trap; the batsman must send his ball over the line,

or he is out; he is also out if he strikes the ball into the air, and it is caught by an opposite player, or if it is bowled back and hits the trap; or if he strikes at the ball twice without hitting it, he is out, and another player takes his place. In many parts there is a practice, when the bowler has sent in the ball, for the striker to guess the number of bats' lengths it is from the trap, if he guess correctly he reckons that number towards his game, but if more than there really are, he loses his innings.

In playing, the trigger must not be struck too forcibly, but just sufficient to rise the ball about a foot, or a little more, above the trap; you may catch it once or twice in your hand before you call *play*, which will enable you to judge better where to take your stand, and strike the ball with the utmost force, and observe in which direction you should send it with the least chance of its being caught. Take plenty of time before you attempt to hit the ball; young players are apt to be in too great a hurry. You will have sufficient time to take a good aim, and strike the ball in the act of falling.

To make a Trap, Bat and Ball.—The trap must first be cut out of a soft piece of wood about seven or eight inches in length, in the shape and in the proportion of an ordinary shoe; hollow out the heel

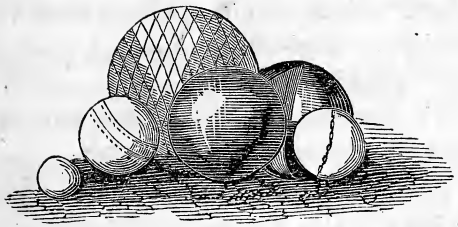
about half way down, and one-third at the toe, through which drill a small hole; in the hollow is fixed the spoon end of the trigger, which holds the ball—it is secured by an iron or wooden pin, which acts as a fulcrum. The trigger, or tongue, is cut out of a piece of wood of this shape, a hole being drilled through the thick part, and the spoon end slightly curved out to hold the ball.



The Ball. The directions given at page 130 will do for the purpose.

The Bat.—The spoon-shaped is the one now most used by players; it is made out of a piece of flat wood about an inch thick, and in the form of the cut, but they vary according to taste or fashion.

BALLS.



GAMES played with balls are of great antiquity. The Greeks used four kinds, viz. : the little ball, the great ball, the empty ball, and the leathern ball. The empty ball was blown up with air, something like the foot-ball of the present time ; and the leathern ball was stuffed with sand or bran, and suspended from the ceiling. The Romans, also, had four kinds of balls, and it is stated that Augustus Cæsar, particularly, was greatly delighted with the amusement.

Hand-Ball or Fives. This was formerly a very popular pastime in England ; in modern times it has been partially superseded by the use of the *racket.* For boys, the hand-ball has all the advantages of ex-

ercise, and does not require so high a wall or regular ground as for racket. The game is played with the palm of the hand; two or more take sides, the best players being nearest the wall; a chalked line being previously drawn upon it, about two feet from the ground, and the great art is just to send the ball over the line, and keep it within the boundaries.

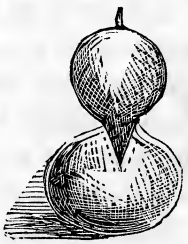
To make a Hand-Ball. Take a piece of India-rubber, or cork, about the size of a large marble, and wind round it worsted till you have worked it quite round, and about the size of an ordinary orange; fix the end by lacing it under the layers, and without making a knot. For an ordinary game the ball will then do, but if you wish to preserve it, or make a more finished work of it, you must cover it with soft leather, and make all as tight as possible that it may rebound easier.

Racket Balls may be made in the same way. It is stated that this game was introduced into England during the reign of Henry III., by persons of rank and family, who erected what are called *tennis courts*, for the performance of the exercise.

Foot-Ball. Formerly this game was the popular holiday amusement. It is a most exciting sport, the best place for it being a large field or common. Any number may play at it. When a match is made, each

party takes a side, till equally divided in numbers; two sticks being driven into the ground for the goal, a few feet apart. The skill of the players is best displayed by attacking and defending the goals. Shins occasionally suffer, and the exercise is sometimes exceedingly violent.

To make a Foot-Ball. Take a large bladder, steep it in water, blow it out by the aid of a piece of pipe and tie it tightly round the neck with string; being satisfied that it is perfectly air-tight, you must untie the string and empty the bladder again. You must then proceed to place it in a leathern case, which ought also to be soaked in water, to make it work more easily into form. Insert the lower end of the bladder into the hole in the leather, fill it again with air, and tie the neck-string, and it will then be more like two balls than one. You next take a firm hold of the outer portion of the bladder, and twist it round, gradually driving all the air into the lower part in the leathern case, and the shape will be further developed. The outside portion must then be forced gently into the case, and a tongue of leather placed over the ori-



fice ; the whole must be laced together, and your ball will be ready for use.

India-rubber, which appears to be coming into use for almost everything, is now much used for making all kinds of balls.

THE BOOMERANG.

This is an instrument lately introduced into this country from Australia. It is said to be used by the natives with great skill and dexterity ; so much so as to kill a man behind a tree. If skilfully thrown, it may be made to go in any direction, and after striking the desired object it will return to the thrower. It should be held horizontally when thrown, and cast by bringing the arm backwards.

It is made of a curved piece of wood, flat on one side, and a little rounded on the other. It is so simple, and its results so extraordinary, that it has already become very popular in this country.

GOLFING.

In Scotland this game is much practised at the present time. It is much the same as a rustic game of the Romans, and is played with a long club, and a small ball made of leather and stuffed with feathers. The game is played with two or more persons—there being an equal number on each side ; only two balls are used, one belonging to each party, and each one striking in turn ; if the last striker does not send the ball as far as his opponent, the next one of the same party must then strike one, and so on, counting one, two, or three, as the case may be. The object is, to drive the balls into certain holes in the ground, and the party that does so the soonest, or with the fewest number of strokes, wins the game.

The Golf Club is generally made of some tough wood, such as beech, and as it turns upwards is planed off to adapt itself to the handle, to which it is partly glued and tightly corded down. They vary in length from three to

four feet, according to the height and length of arm of the player. The handle is generally bound with list, velvet, or cord ; and in addition to the face of the club it is sometimes further secured by a piece of bone or ivory, about an inch thick. Clubs, however, vary according to circumstances, and the nature of the ground.

The Golf Ball is made of stout leather, being first well soaked in hot water, and sewed together, and then turned inside out, leaving a small opening by which it is stuffed full with feathers. When the leather dries it contracts into a hard ball which should not be larger than an egg, but not circular as an ordinary ball.

HOCKEY, OR CLUB.

This is a favourite game in the north of England. Two or more parties form sides, and the object is to drive the ball (a wooden one) over the bounds, which are generally marked out at about forty or fifty

yards. The best place for it to be played is in a by road, not too wide, with a hedge or palings on each side; and the party that first sends the ball over the bounds, wins the game; either party sending it over the side bounds, loses the game. The clubs are formed according to the taste and fancy of the player. Some boys prefer one with a stout, knobby handle, and others, again, like those with more curve at the stroke; but when one is got to answer the purpose, it is valuable to the owner. The best way is to select one from some wood or hedge, and have as little cutting or making about it as possible.

THE SUCKER.

This is a very simple toy, and easily made. Take a piece of leather, and cut it perfectly round, about the size of the palm of your hand; make a small hole through the centre, just large enough to insert within it a piece of fine cord, about four or five feet in length; at the end inside the sucker tie a knot, and to the other end tie a piece of wood five inches long, for the handle. When completed, soak the leather for some time in water till it is sufficiently pliable, and take a smooth stone and press down the leather upon it with your foot; underneath the sucker a *vacuum* is formed, and by lifting the string, the external air pressing on all sides of your sucker, you will be able to carry a considerable weight.

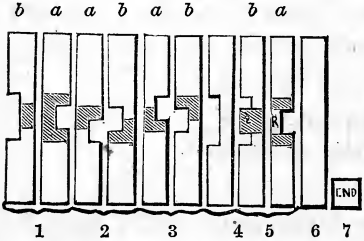
Practical Puzzles.

Many of the best puzzles have no doubt been invented by captives, to wile away the time of a long and dreary imprisonment; thus does the misery of a few frequently conduce to the amusement of many. A good puzzle requires considerable thought, calculation, patience, and management. It is sometimes highly amusing to watch the progress of any one attempting to perform a puzzle for the first time; to see him elated with hope when he thinks he is doing it so cleverly, when you know he is farther off the desired end than when he actually began. And it is equally laughable to witness his increasing despair as he finds himself getting more and more involved, when you are fully aware, by a single happy turn, how easily he might terminate his troubles.

The Chinese Cross.

Procure six pieces wood, bone, or metal, made

of the same length as No. 6 in the adjoining figure, and each piece of the same size as No. 7. It is required to construct a cross with six arms, from these pieces, and in such a manner that it shall not be displaced when thrown upon the floor. The shaded parts of each figure represent the parts that are cut out of the wood; and each piece marked *a* is supposed to be facing the reader, while the pieces marked *b* are the right side of each piece turned over towards the left, so as to face the reader; No. 7 represents the end of each piece of wood, &c., and is given to shew the dimensions.



To make the Chinese Cross.—Place Nos. 1 and 2 together, as in fig. 1; hold them together with your finger and thumb of the left hand horizontally, and with the square hole to the right; push No. 3—placed in the same position *facing you* (*a*) in No. 4—through the opening at K, and slide it to the left at A, so that the profile of the pieces should be as in fig. 2. Now push No. 4 *partially* through the space from below upwards, as seen in fig. 2. Place No. 5 crossways upon the part

Fig. 1.

B, so that the point R is directed upwards to the right hand side; then push No. 4 quite through, and it will be in the position shewn by the dotted lines in fig. 2. All that now remains is to push No. 6, which is the key, through the opening M, and the cross is completed as in fig. 3.

Fig. 2.

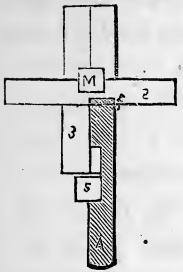
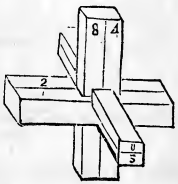
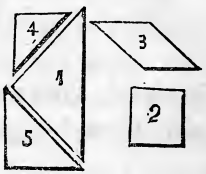


Fig. 3.

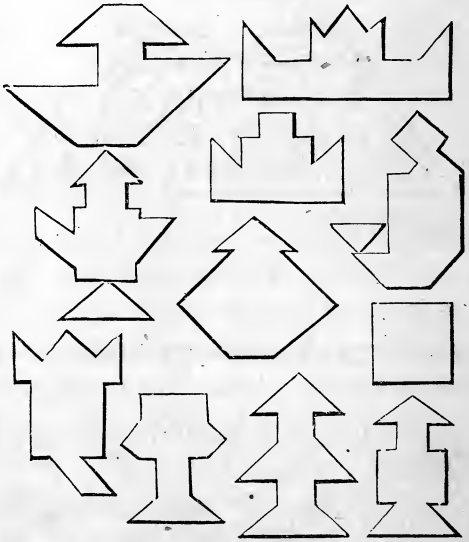


The Chinese Puzzle.

This puzzle, being one for the purpose of constructing different figures by arranging variously shaped pieces of card or wood in certain ways, requires no separate explanation. Cut out of very stiff cardboard—or thin mahogany, which is decidedly preferable—seven pieces, in shape like the annexed figures, and bearing the same proportion to each other; one piece must be made in the shape of fig. 1, one of fig. 2, and one of fig. 3, and two of each of the other figures.

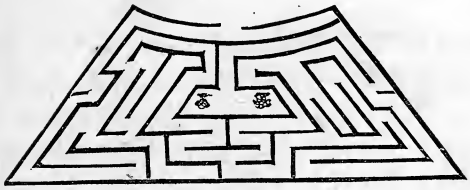


The combinations of which these figures are susceptible are almost infinite, and we subjoin a representation of a few of the most curious. It is to be borne



in mind, that all the pieces of which the puzzle consists must be employed to form each figure.

The Maze or Labyrinth.



This Maze is a correct ground plan of one in the gardens of the Palace of Hampton Court. No legendary tale is attached to it of which we are aware ; but its labyrinthine walks occasion much amusement to the numerous holiday parties who frequent the palace grounds. The puzzle is to get into the centre, where seats are placed under two lofty trees, and many are the disappointments experienced before the end is attained ; and even then the trouble is not over, it being quite as difficult to get out as to get in.

The Cardboard Puzzle.

Take a piece of cardboard or leather, of the shape and measurement indicated by the diagram ; cut it in such a manner that you yourself may pass through it, still keeping it in one piece.

To cut the Cardboard Puzzle. Double the cardboard or leather lengthways down the middle, and then cut first to the right, nearly to the end (the narrow way), and then to the left, and so on to the end of the card ; then open it, and cut down the middle, except the two ends. The

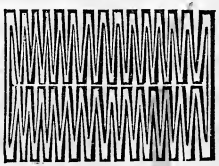
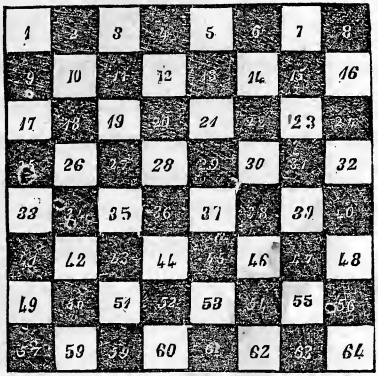


diagram shows the proper cuttings. By opening the cardboard or leather, a person may pass through it.

Moving the Knight over all the Squares alternately.



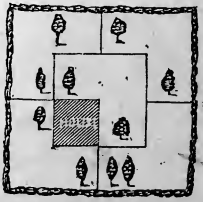
Let Black Queen's Rook's square count 1 (as in the above diagram); Black King's Rook, 8; and count all the other squares in the same way, from 9 to 64. Place the Knight upon Black King's Rook's square 3, and move as follows:—23, 40, 55, 61, 51, 57, 42, 25, 10, 4, 14, 24, 39, 56, 62, 52, 58, 41, 26, 9, 3, 13, 7, 22, 32, 47, 64, 54, 60, 50, 33, 18, 1, 11, 5, 15, 21, 6, 16, 31, 48, 63, 53, 59, 49, 34, 17, 2, 12, 27, 44, 38, 28, 43, 37, 20, 35, 45, 30, 36, 18, 29, and 46. It may be well to chalk the figures on the board as a guide, until the feat is understood.

The Accommodating Square.

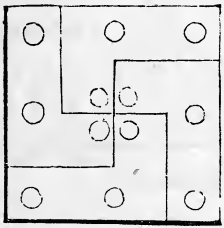
Take eight squares of card, and divide four of them from corner to corner, so that you will have twelve pieces; form a square with them when put together.

The Divided Garden.

A person has a square plot of ground having a house built upon it, which he lets out to various tenants; he was desirous of dividing it so that each of the five inmates should have an equal share of the garden, and two trees. He contrived it in this way.

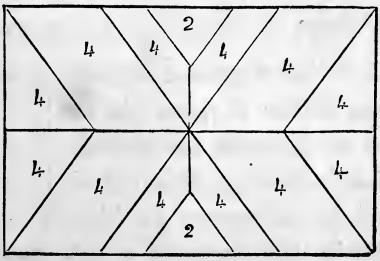


to contain three circles, without cutting into any of them ; and the result will be as follows :—

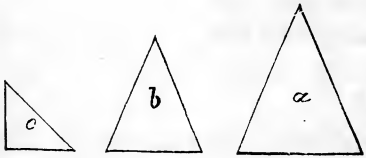


The Puzzle of Fourteen.

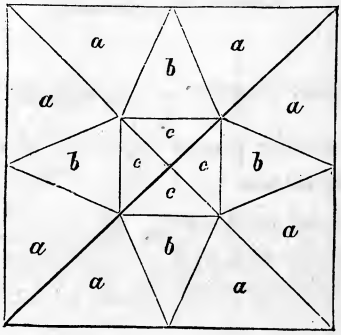
Cut out fourteen pieces of paper, card, or wood, of the same size and shape as those shewn in the cut, and then form an oblong with them, as in the following cut :—



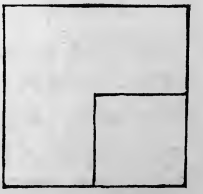
The Card Square.



Cut out eight pieces of card or paper of the shape of *a*, four of *b*, and four of *c*, and of proportionate sizes, and with them form a square.

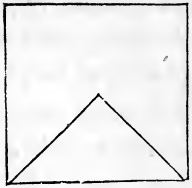


Puzzle of the Two Fathers.



Two fathers have each a square of land. One father divides his so as to reserve to himself one-fourth as in the adjoining cut. The other divides his so as to reserve to himself one-fourth in the form of a tri-

angle. They have each four sons, and each divides the remainder among his sons in such a way that each son will share equally with his brother, and in a similar shape. How were they divided ?



The first father divided the land as in fig. 1. The

Fig. 1.

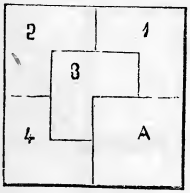
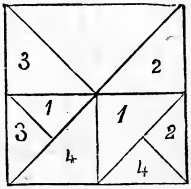


Fig. 2.

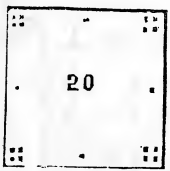


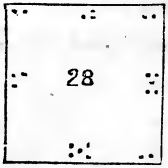
second father divided it as in fig. 2. The different figures represent the several sons' portions.

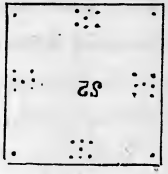
The Nuns.

Twenty-four nuns were arranged in a convent by night by a sister, to count nine each way, as in the opposite cut. Four of the party went out to take a walk by moonlight. How were the remainder placed in the square, so as still to count

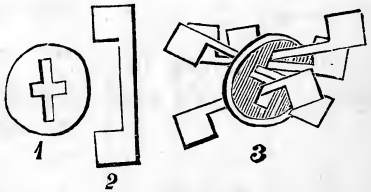
nine each way? The four who went out returned bringing with them four friends; how were they all placed so as to count nine each way, and thus deceive the sister as to whether there were 20, 24, 28, or 32 in the square?





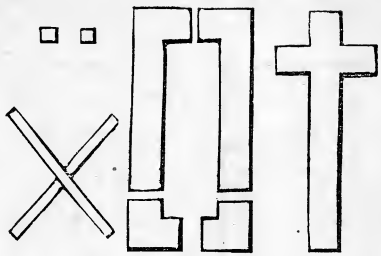


The Double-headed Puzzle.



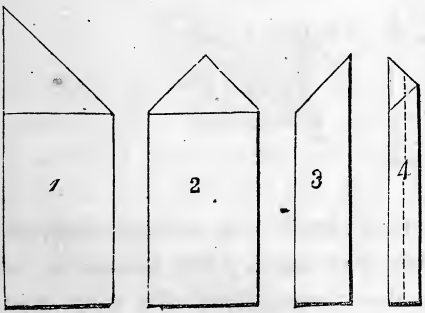
Cut out of a piece of wood the circular form of fig. 1, and four others like fig. 2; the puzzle is in getting them all into the cross-shaped slit, until they look like fig. 3. After which, arrange them side by side in the short arms of the cross, draw out the centre piece, and the rest will easily follow. The reverse of the same process will put them back again.

Cutting out a Cross.



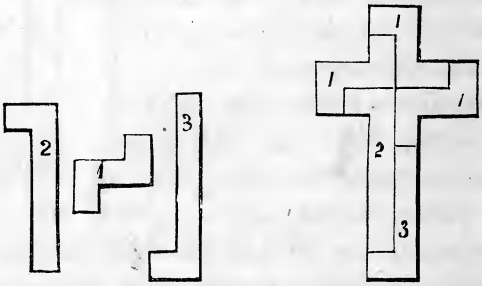
Cut out of a single piece of paper, and with one cut of the scissors, a perfect cross, and all the other forms of the diagram.

Take a piece of writing paper, about three times as long as it is broad, say six inches by two. Fold the upper corner down, as fig. 1; then fold the other upper corner over the first, and it will appear as fig. 2; you next fold the paper in half lengthwise, and it will appear as fig. 3. Then the last fold is made lengthwise, also in the middle of the paper, and it will make fig. 4, which, when cut through with the scissors in the direction of the dotted line, will make all the forms mentioned.

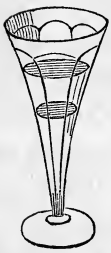


Another Cross Puzzle.

Cut out of cardboard three pieces of the shapes and numbers following, and with them make a cross.



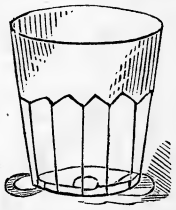
The Glass and Coins.



Place a sixpence in the bottom of a glass, and over the latter put a half-crown. The puzzle is to remove the small coin from beneath the larger one without touching either of the coins or touching or upsetting the glass. To do this you must blow with considerable force down one side of the glass, upon the edge of the half-crown. The sixpence will be expelled by the force of the air, and will fall either upon the upper surface of the half-crown, or upon the table.

Another Glass Puzzle.

Place a sixpence between two half-crowns, and lay upon the larger coins a glass. Remove the sixpence without displacing either of the half-crowns or the glass.



To do this a table-cloth is necessary; for this reason the trick is best suited to the breakfast or dinner-table. Having placed the glass and coins as in the above cut, simply scratch the table-cloth with the nail of the fore-finger in the direction you wish the sixpence to move, and it will answer directly.

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